WILDLIFE REVIEW

AN ABSTRACTING SERVICE FOR WILDLIFE MANAGEMENT
ISSUED FOR THE INFORMATION OF COOPERATORS
BY THE
BUREAU OF BIOLOGICAL SURVEY
UNITED STATES DEPARTMENT OF THE INTERIOR

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Bibliography: Filing wildlife literature

Yeager, Lee E. Subjects for filing wildlife literature, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C. 75 cents a copy), 4(1), Jan. 1940, pp. 44-54, 1 fig., 1 table.

Author's abstract: "The author's system of indexing wildlife literatur is described. This is essentially a flexible, related-subject arrangement of about 400 headings under five main divisions of the literature, which are General, Organizational, Specific, Management, and Basic Research. As a filin policy, references are placed as specifically as possible, and a simple cross reference card system is used for citations which could be placed under two or more subjects. Discussed are several indexing systems for references and reprints, together with various helps used by the author. Filing mechanics, difficulties of file making for field workers, the convenience of clear, descriptive titles, and the desirability of developing a standard system for indexing wildlife literature are treated briefly. The complete list of filing subjects is given."

Bibliography: Zoology of Tennessee

Shoup, Charles S. An annotated bibliography of the zoology of Tennessee and the Tennessee Valley region, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 21(3), May 1939, pp. 583-635.

Classified according to phyla of animals and provided with a locality index.

Biological Survey: Annual Report, 1938-39

Gabrielson, Ira N. Report of the Chief of the Bureau of Biological Survey 1939 (Supt. of Documents, Washington, D. C. 15 cents a copy), 75 pp., 6 tables, December 20, 1939.

The last of a series of 34 annual reports under the Department of Agriculture. Features deemed of special interest are functioning of The Federal Aid to Wildlife Restoration Act, continued rapid progress of the Federal wildlife refuge program, and establishment of the Patuxent Research Refuge. Numerous other activities are reviewed in brief paragraphs and the operations of the Bureau are summarized by subjects including, investigations of migratory waterfowl, birdbanding, and wildlife researches including those of the Federal-State cooperative units and those on economic investigations, fur animals, and disease and rodent control. Federal Aid in Wildlife Restoration is again treated with a tabulation of approved projects, showing their locations and purposes. Acquisition of more than 2,000,000 acres of refuge lands is shown in a table giving localities and project designations. The restoration of refuge areas by Federal works agencies and their biological development are described. Several new and numerous older refuges and ranges are briefly discussed, especially as to their utilization by wildlife. The report includes also sections on the enforcement of conservation laws, on importations of mammals and birds, on predator and rodent control, and on wildlife conservation in Alaska.

Classification: Ribes

Darlington, H. T., and L. B. Culver. Keys to the species of Ribes occurring in the Great Lakes Region, Michigan State College (East Lansing) Circular Bul. 170, 24 pp., 13 figs., June 1939.

Prepared in the interest of Ribes eradication, this bulletin may, nevertheless, be of value to wildlife managers concerned with the plants as food and cover for wildlife. It contains keys to 13 species of Ribes in both winter and summer condition, brief additional descriptions, and illustrations of their principal characters.

Classification: Snakes

Blanchard, Frank N. A key to the snakes of the United States, Canada, and Lower California. ix+65 pp., 78 figs. Lithoprint. (University of Michigan Press, Ann Arbor, Mich. 80 cents a copy.)

Well illustrated key to 191 species and subspecies; distribution of the forms briefly indicated; glossary of 29 terms; bibliography of 30 titles; index. Should be highly useful to anyone wishing to identify snakes.

Conservation

Rush, William M. Wildlife management and our big game animals, Nature Magazine (1214 Sixteenth St., N.W., Washington, D. C. 35 cents a copy), 33(1), Jan. 1940, pp. 29-36, 3 photos.

Conservation sentiment abounds and funds are sufficient but management may not be adequate. The increase in the numbers of antelopes in the West and of white-tailed deer in the East have been more or less fortuitous and management now faces the test of regulating these populations in accordance with the carrying capacities of environments and with all interests involved. Problems connected with western elk overpopulations are serious and are being satisfactorily handled only in Utah. The remedy for depletion of environment is forward-looking planning, not letting nature take its course. Hunting should be properly directed to achieve needed herd regulation. Numbers of big game animals must be restricted to those the available winter range will support. The relation of predators to the ruminants is not likely to change much from that now prevailing. Mountain sheep are in the most precarious position and should be given carefully considered treatment as soon as practicable. Other species are briefly annotated. The great needs are for cooperation by all agencies in a definite national wildlife conservation program, for real management, and for education as distinguished from propaganda.

Conservation: Missouri Wildlife

Anon. Forest trees of Missouri, Missouri Conservation Commission Conservation Bul. 20 (Jefferson City, Mo. 10 cents a copy), 66 pp., illus., 1939.

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Annotated account (most of the common species illustrated) with remarks on the value to wildlife of many of the groups.

Conservation: Municipal bird sanctuary

Anon. Henderson's municipal bird sanctuary, North Carolina Wildlife Conservation (Division of Game and Inland Fisheries, Raleigh), 4(1), Jan. 1940, pp. 12, 15, 1 photo.

The whole incorporation was made a bird sanctuary in 1937. Education through schools, bird club meetings, and field trips, scout organizations, and bird house contests have made the people bird-conscious and given the school-children a constructive rather than destructive attitude toward birds. "No organization or individual has ever refused to give support."

Control: Coyote

Rush, William M. Another view of coyote control, National Wool Grower (509 McCormick Bldg., Salt Lake City, Utah), 29(11), Nov. 1939, pp. 13-14, 30-31, 1 photo.

Urges bounties, low where the animals are common but higher as they become rarer. Under high bounties the release of coyotes to breed would seldom or never occur. A price of $25 on the head of a coyote would soon bring about drastic reduction in their numbers. That amount is not unreasonable as it is just about what it costs to get each coyote under the present system which seems to remove only a rather constant annual crop and is restricting neither population nor the range of the coyote. The hunter system is not very efficient and poison is expensive, ineffective, and dangerous to other animals. The author believes that proper application of a bounty system would soon make the coyote scarce.

Control: Deer

Adcock, Reginald. Deer control in the home counties, The Field (114 Fleet St., London, E.C. 4, England. 1 shilling a copy), 174(4531), Oct. 28, 1939, pp. 858-859, 5 photos.

Roe and fallow deer, descendants of park-kept animals, are remarkably scattered through Britain. "Yet however pleasant it may be to have occasional glimpses of these graceful creatures stepping daintily through our woodlands or bounding lightly over hedges and streams, there is no gainsaying the fact that in farming districts they are responsible for a serious amount of damage. Feeding as they do by night, the difficulty of keeping them away from crops are well nigh insuperable, unless very considerable expenditure is to be incurred in the shape of deer-proof fencing. Their appetite, as might be expected of ruminants scaling anything up to 10st. are large, and their tastes are supremely catholic; crops of all kinds are ravaged; beans, cabbages, roots and potatoes are devoured in great quantities; corn fields are plundered and the harvests laid; orchards and young plantations are invaded, the trees barked and the young shoots eagerly consumed. It does not take long to realise, therefore, that, however much

pleasure may be derived from keeping these animals in suitably confined areas, their maintenance in a wild state in a farming district calls for a higher sacrafice from the agricultural community than the latter can possibly be expected to make. Tenants have in fact in several instances threatened to give up their farms, if steps were not taken to reduce the numbers of the vagrant deer." The control method recommended is shooting, but done selectively, by a few persons, rather than by drives.

Control: Deer repellent

Weiss, Siegfried. A simple deer repellent for conifer plantations, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C. 75 cents a copy), 4(1), Jan. 1940, pp. 77-79, 2 tables.

Cowdung, 5 parts, hydrated lime 1 part, plus enough water to make a thin plaster applied to terminals rather effectively protected them and did not in itself injure the buds.

Control: Rats

Fallowfield, John. Declaration of war on rats, The Field (114 Fleet St., London, E.C. 4, England. 1 shilling a copy), 174(4531), Oct. 28, 1939, p. 849, 1 photo.

With food conservation a necessity in Great Britain, rat control is a national duty. Each rat is estimated to cost the country one pound ($4.86) a year. "Under the Rats and Mice Destruction Act of 1919 all occupiers of premises are expected to control these rodents, but the law is seldom enforced." "One of the most serious things is the fact that the Black rat is spreading fast and is exterminating the Common or Brown rat." Being a better climber, it is not so amenable to rat-proof construction as is the Brown rat. Damage preventive steps are outlined and also aggressive control measures including poisoning with red squill, etc., and gassing. "Farmers should encourage all the animals and birds that help to keep down rats and mice." Owls, hawks, foxes, stoats, and domestic cats are mentioned.

Control: Wolf

Roberts, B. G. The tricks of trapping wolves, Forest and Outdoors (610 Canada Cement Bldg., Montreal, Canada), 35(11), Nov. 1939, pp. 340-341, 1 photo.

Suggestions as to type and care of traps, scent posts, and the making of sets.

Destruction: Highway mortality, Michigan

Martin, Russell J. Highway toll, Michigan Conservation (Michigan Dept. of Conservation, Lansing), 9(3), Dec. 1939, p. 2.

General remarks, records by two State employes, and estimates of probable mortality in the State. Care urged.

Destruction: Highway mortality, Texas

Davis, William B. Mortality of wildlife on a Texas highway, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C. 75 cents a copy), 4(1), Jan. 1940, pp. 90-91, 1 table.

Ten months records of mammals found dead along 6 miles of concrete highway in Brazos County indicated an average mortality of nearly 10 per mile-year. Extending this figure over the mileage of fast highways in the State gives an estimate of nearly 157,000 mammals killed annually; probable mortality on unimproved roads (40 percent as great) would bring the figure to nearly 180,000. This is for mammals alone; birds suffered less but reptiles more.

Diseases and Parasites: Acarina, Amblyomma

Cooley, R. A., and Glen M. Kohls. Amblyomma philipi--a new tick from Texas and Mexico, with a key to known species of Amblyomma in the United States (Acarina: Ixodidae), U. S. Public Health Service Rep. 54(2), Jan. 1939, pp. 44-47, 2 pls. Reprint 2023, 4 pp., 2 pls. (Supt. of Documents, Washington, D. C. 5 cents a copy).

The title is almost an abstract. The ticks described were collected from cottontails, jack rabbits, and coyotes. Separate keys are presented for the males and females of 6 species of Amblyomma.

Diseases and Parasites: Acarina, Dermacentor

Cooley, R. A. The genera Dermacentor and Otocentor (Ixodidae) in the United States, with studies in variation, U. S. Public Health Service, National Institute of Health Bul. 171 (Supt. of Documents, Washington, D. C. $1.25 a copy), 89 pp., 30 pls., 8 figs. 1938.

A systematic monograph, introduced by a general account of these ticks and their role as vectors of diseases. Descriptive terms are defined and illustrated, and the method of measuring the ticks is explained. The history and synonymy of the genus is given as well as key to adults and nymphs. The specific accounts include synonymy; description and illustration of sexes, nymphs, and larvae; records of hosts; and statement of distribution (with map). There is a colored plate, besides other illustrations showing males and females of each species. The genus Otocentor is described as new; type species Dermacentor nitens ranging from Texas to northern South America.

Diseases and Parasites: Acarina, Eutonyssus

Hubbard, M. Eugene. Eutonyssus ewingi n. sp. an ophidian lung mite, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 21(3), May 1939, pp. 657-662, 1 pl.

From rattlesnake in Oklahoma; description, illustration, comparative notes.

Diseases and Parasites: Algal poisoning

Deem, A. W., and Frank Thorp, Jr. Toxic algae in Colorado, Journ. Amer. Veterinary Medical Assoc. (221 N. La Salle St., Chicago, Ill. 75 cents a copy), 95(752), Nov. 1939, pp. 542-544, 1 photo, 1 table.

Mortality among tame ducks at a lake in Weld County, Colo, instigated this study which took botulism into consideration but, nevertheless, led to the conclusion that true algal poisoning had occurred. The alga was identified as Anabaena flos-aquae. Wild birds were found dead about the lake.

Diseases and Parasites: Anaplasmosis

Stiles, Geo. W. Anaplasmosis in cattle, U. S. Dept. of Agriculture Circular 154 (Supt. of Documents, Washington, D. C. 5 cents a copy), 10 pp., 3 figs., revised December 1939.

Nature of the disease, its geographical distribution, symptoms, lesions, diagnosis, and treatment. The publication cited here because the malady is reported to affect the antelope and buffalo.

Diseases and Parasites: Aspergillosis

Durant, A. J., and Elvis R. Doll. Pulmonary aspergillosis in a skunk, Journ. Amer. Veterinary Medical Assoc. (221 N. La Salle St., Chicago, Ill. 75 cents a copy), 95(752), Nov. 1939, pp. 645-646, 2 photos.

One skunk of a litter of 5 reared by a cat died from aspergillosis. Lesions are described.

Diseases and Parasites: Avian malaria

Manwell, Reginald D., and Frederick Goldstein. Strain immunity in avian malaria, Amer. Journ. Hygiene (Prince and Lemon Streets, Lancaster, Pa. $2.50 a copy; single number of any section $1.00), 30(3), Nov. 1939, pp. 115-122, 3 tables.

Experiments with six strains of Plasmodium circumflexum derived from wild birds showed that although immunity was strain specific, it conferred at least partial protection against other strains. Bibliography of 18 titles.

Diseases and Parasites: Cestoda, Choanotaenia

Lincicome, David R. A new tapeworm, Choanotaenia iola, from the robin, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 25(3), June 1939, pp. 203-206, 1 pl., 1 fig., 1 table.

From Illinois; description, illustrations, measurements, comparative notes; redefinition of the family Dilepididae.

Diseases and Parasites: Cestoda, Hymenolepis

Schultz, Richard L. Hymenolepis scalopi n. sp., American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 21(3), May 1939, pp. 641-645, 1 pl.

From moles in Oklahoma; description, illustration, comparative notes. Bibliography of 9 titles.

Diseases and Parasites: Cestoda, Schizotaenia

Olsen, O. Wilford. Schizotaeniasis in muskrats, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 25(3), June 1939, p. 279.

Tapeworms from muskrat compared with those from porcupine; this the firs report of the genus in the muskrat which, in view of all circumstances, appears to be an accidental rather than a normal host.

Diseases and Parasites: Coccidiosis

Appling, Phillip. Control of coccidiosis in the chukar, Game Breeder and Sportsman (205 E. 42nd St., New York, N. Y. 25 cents a copy), 43(11), Nov. 1939, p. 165, 1 photo.

Symptoms and means of distribution of the disease; milk mash treatment; recommendation of 5 preventive measures as follows: "(1) Allow no moist places in the brooder pens; (2) change the old water fountain for a sterilized one twice a day. We sterilized them by turning them up to the sun for a few hours; (3) use contamination proof feeders that will not spill food on the ground; (4) go over dropping accumulations daily with a firekill torch; (5) use some sort o fly-killing device to reduce the number of flies, or screen them out entirely."

Diseases and Parasites: Coccidiosis

Ormsbee, Richard A. Field studies on coccidiosis in the ring-neck pheasants of eastern Washington, Parasitology (Cambridge University Press, 200 Euston Road, London, N.W. 1, England (18 shillings and sixpence a copy), 31(3), Sept. 1939, pp. 389-399, Pl. 11, 2 tables.

Methods of the study are described. A section on taxonomy includes descriptions (with figures) of one previously described, two new, and one undetermined species of Eimeria. A table gives comparative data for them. The total average incidence of all species of coccidia was 38 percent; representation of the parasites was reduced in winter. All infections observed were light and apparently had little pathological significance. The effect of temperature upon oocysts and sporulation is discussed. Bibliography of 29 titles.

Diseases and Parasites: Of cottontail, Iowa

Morgan, B. B., and E. F. Waller. A survey of the parasites of the Iowa cottontail (Sylvilagus floridanus mearnsi), Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C. 75 cents a copy), 4(1), Jan. 1940, pp. 21-26.

Authors' abstract: "All of the 210 Iowa cottontails examined during 1938-39 harbored at least one, and some as many as seven, species of coccidia. Three species were reported as new for North America. Sarcocystis cuniculi was present in approximately 10% of the rabbits. Cittotaenia variabilis and Taenia pisiformis (larva) were the only cestodes and Hasstilesia tricolor the only trematode identified. The nematodes found were: Trichuris leporis, Trichostrongylus calcaratus, Obeliscoides cuniculi, and Nematodirus leporis. Three species of fleas, Cediopsylla simplex, Hoplopsyllus affinis, and Ctenocephalides canis, and one species of tick, Haemaphysalis leporis-palustris, were identified."

Diseases and Parasites: Distemper

Green, R. G., and C. A. Evans. Rapid diagnosis of canine distemper, Cornell Veterinarian (Cornell University, Ithaca, N. Y.), 29(1), Jan. 1939, pp. 35-40, 1 pl.

Canine distemper affects also foxes, minks, and ferrets in captivity. The method described is examination of stained smears from the epithelium of the bladder. Bibliography of 14 titles. See abstract of a companion article in WILDLIFE REVIEW No. 22, August 1939, p. 8.

Diseases and Parasites: Leukoencephalitis

King, Lester S. Moose encephalitis, Amer. Journ. Pathology (818 Harrison Ave., Boston, Mass.), 15(4), July 1939, pp. 445-454, Pls. 74-75.

Symptoms, lesions, and seasonal distribution of the disease now known from Maine and Minnesota. Bibliography of 17 titles.

Diseases and Parasites: Mange in squirrels

Payne, Ernest A. The return of the California gray squirrel, Yosemite Nature Notes (Yosemite National Park, Calif.), 19(1), Jan. 1940, pp. 1-3, 2 figs.

Mange caused by mites of the genus Notoedres first noticed in California in 1917 spread rapidly and greatly reduced the numbers of gray squirrels. By 1926 they were nearly exterminated throughout the Yosemite area. Now the population is definitely on the increase. Competition with the red squirrel or Sierra chickaree is discussed.

Diseases and Parasites: Nematoda, Dispharynx

Olsen, O. Wilford. Dispharynx pipilionis, a new spiruroid nematode from the red-eyed towhee, American Midland Naturalist (Notre Dame, Indiana), 21(2), March 1939, pp. 472-475, 1 pl.

Description and illustration of a new species from Pipilo e. erythrophthalmus from Kentucky. A key to 13 species of the genus (with host records) is given.

Diseases and Parasites: Nematoda, Rictularia

Cucklor, Ashton C. Rictularia onychomis n. sp. (Nematoda: Thelaziidae) from the grasshopper mouse, Onychomys leucogaster (Wied.), Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 25(5), Oct. 1939, pp. 431-435, 1 pl.

Key to 24 species of the genus, 1 from Nebraska described (and illustrated) as new. Bibliography of 19 titles.

Diseases and Parasites: Nematoda, Spirocerca

Hill, William C. Spirocerca longispiculata n. sp., American Midland Naturalist (Notre Dame, Indiana. $1.00 a copy), 21(3), May 1939, pp. 636-640, 1 pl.

From opossums collected in Oklahoma; description, illustration, comparative notes. Key to 4 species of the genus. Bibliography of 7 titles.

Diseases and Parasites: Protozoa, Haemobartonella

Tyzzer, Ernest Edward, and David Weinman. Haemobartonella n. g. (Bartonella olim pro parte), H. microti n. sp., of the field vole, Microtus pennsylvanicus, Amer. Journ. Hygiene (Prince and Lemon Sts., Lancaster, Pa. $2.50 a copy; single number of any section $1.00), 30(3), Nov. 1939, pp. 141-157, 1 pl., 2 figs., 2 tables.

Seven different types of blood parasites have been observed in the common field vole; morphological and biological characters are treated for one of them here described as new from Massachusetts; comparisons with other micro-organisms known from the blood of mice; tests of susceptibility to infection with deer mice and laboratory animals were negative. Bibliography of 28 titles.

Diseases and Parasites: Protozoa, Haemoproteus

Coatney, G. Robert, and Evaline West. Studies on Haemoproteus sacharovi of mourning doves and pigeons, with notes on H. maccallumi, Amer. Journ. Hygiene (Prince and Lemon Sts., Lancaster, Pa. $2.50 a copy), 31(1) C, Jan. 1940, pp. 9-14, Pl. 1.

The two forms named in the title though morphologically similar are apparently physiologically different; both were found in the blood of young mourning doves in Nebraska. Notes on their characteristics and development in captive pigeons. Bibliography of 13 titles.

Diseases and Parasites: Protozoa, Hexamita

McNeil, E., E. D. Platt, and W. R. Hinshaw. Hexamita sp. from quail and from chukar partridges, Cornell Veterinarian (Ithaca, N. Y.), 29(3), July 1939, pp. 330-333.

Report of this parasite in Valley and Gambel's quails and in the chukar partridge on California game farms. Description of the parasites and of the pathological conditions with which they were associated. Notes on experimental transmission. Summary of previous records from birds; bibliography of 9 titles.

Diseases and Parasites: Psittacosis

Lazarus, Alfred S., and K. F. Meyer. The virus of psittacosis, Journ. Bacteriology (Williams and Wilkins Co., Baltimore, Md.), 38(2), Aug. 1939. I. Propagation and developmental cycle in the egg membrane, purification, and concentration, pp. 121-151, 5 tables; II. Centrifugation, filtration, and measurement of particle size, pp. 153-169, 4 tables; III. Serological investigations, pp. 171-198, 3 figs., 5 tables.

Report on highly technical laboratory investigations with extensive bibliography. For the general reader, the most significant conclusion is that the virus of psittacosis acts in all respects as a small microorganism requiring an intracellular habitat for survival and multiplication.

Diseases and Parasites: Of Sciuridae

Katz, J. S. An annotated bibliography of references concerning parasites of squirrels (Family, Sciuridae), Ohio Wildlife Research Station (Columbus) Release 131, 21 pp., mimeographed, Dec. 1939.

This leaflet contains an abstract of the author's thesis on Parasites of Ohio Squirrels with a bibliography of 15 titles. This is followed by an annotated list of 82 publications referring to parasites of all members of the family Sciuridae.

Diseases and Parasites: Shock disease

Green, R. G., C. L. Larson, and J. F. Boll. Shock disease as the cause of the periodic decimation of the snowshoe hare, Amer. Journ. Hygiene (Prince and Lemon Sts., Lancaster, Pa. $2.50 a copy; single number of any section $1.00), 30(3), Nov. 1939, pp. 83-102, 2 figs., 6 tables.

Summary of knowledge of cycles in snowshoe hares; review of concepts as to cause; no significant variation found in rate of reproduction in relation to the cycle; statistics on hare populations of the study area of the authors in

Minnesota (number per square dropped from 473 in 1933 to 32 in 1938); effects of predators on cycles (not controlling); discussion of infectious diseases and parasites in relation to the die-off in which all but shock-disease are eliminated as causes; report on studies of this malady in field and laboratory, as to symptoms, lesions, and cause; "it is our conclusion that this disease of undetermined etiology is the mortality factor that brings about the periodic decimation of the snowshoe hare." Bibliography of 24 titles.

Diseases and Parasites: Siphonaptera, Opisodasys

Jellison, Wm. L. Opisodasys Jordan 1933, a genus of Siphonaptera, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 25(5), Oct. 1939, pp. 413-420, 3 pls.

Comparative descriptions, illustrations, and records of hosts (rodents) of 5 North American species all known. Bibliography of 9 titles.

Diseases and Parasites: Of skunk

Stegeman, LeRoy C. Some parasites and pathological conditions of the skunk (Mephitis mephitis nigra) in central New York, Journ. Mammalogy (Wm. B. Davis, A. & M. College, College Station, Texas. $1.00 a copy), 20(4), Nov. 1939, pp. 493-496.

Notes on lice, fleas, ticks, mites, and cestodes, and on miscellaneous pathological conditions, one of which is due to a worm (Filaroides mustelarum).

Diseases and Parasites: Trematoda, Brachylaemus

Harkema, Reinard. A new species of Brachylaemus from the barred owl, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 25(3), June 1939, p. 277, 1 fig.

From North Carolina; description, illustration; comparative notes.

Diseases and Parasites: Trematoda, Gorgoderina

Rankin, John S., Jr. The life cycle of the frog bladder fluke, American Midland Naturalist (Notre Dame, Indiana), 21(2), March 1939, pp. 476-488, 2 pls.

Review of literature of bladder flukes in amphibians, 26 titles of which are cited. Description of methods, experiments, stages in the life history (illustrated) of Gorgoderina attenuata, the intermediate host of which is a small bivalve (Sphaerium).

Diseases and Parasites: Trematoda, Halipegus

Thomas, Lyell J. Life cycle of a fluke, Halipegus eccentricus n.sp. found in the ears of frogs, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 25(3), June 1939, pp. 207-221, 2 pls.

From Rana spp. Michigan; description of the new species, and all of its stages, illustrated; report on experimental infections; bibliography of 18 titles.

Diseases and Parasites: Trematoda, Opisthorchis

Wallace, F. G., and Lawrence R. Penner. A new liver fluke of the genus Opisthorchis, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 25(5), Oct. 1939, pp. 437-440, 1 fig.

O. tonkae n. sp. described from Minnesota muskrats; illustration and comparative notes. Bibliography of 8 titles.

Diseases and Parasites: Trematoda, Prosthogonimus

Gower, W. Carl. Infectivity of Prosthogonimus macrorchis Macy for the common ring-necked pheasant, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 25(5), Oct. 1939, pp. 447-448.

Tests by feeding probably infected dragonfly nymphs indicated the pheasant to be a refractory host to this fluke.

Diseases and Parasites: Trematoda, Psilostomum

Beaver, Paul C. The morphology and life history of Psilostomum ondatrae Price, 1931 (Trematoda: Psilostomidae), Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 25(5), Oct. 1939, pp. 383-393, 1 pl.

Description and illustration of the various stages and record of hosts, which include the muskrat and a number of birds. Life histories of this and related forms. Bibliography of 6 titles.

Diseases and Parasites: Trematoda, Tamerlania

Penner, Lawrence R. Tamerlania melospizae n. sp. (Trematoda: Eucotylidae) with notes on the genus, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 25(5), Oct. 1939, pp. 421-424, 1 fig.

Previous records of parasites of the family and their hosts; history and diagnosis of the genus; key to 5 species, one new, which is described and figured; host, Lincoln's sparrow; locality Minnesota. Bibliography of 10 titles.

Diseases and Parasites: Trematodes of Tennessee

Harwood, Paul D. Notes on Tennessee helminths. IV. North American trematodes of the subfamily Notocotylinae, Journ. Tenn. Acad. Sci. (Dr. J.T. McGill, Vanderbilt University, Nashville, Tenn. 50 cents a copy), 14(3), 1939, pp. 332-340; 14(4), 1939, pp. 421-437, 1 pl.

Review of records of members of the subfamily in this country; they are mostly from waterfowl or shore birds. Diagnoses, keys, and descriptions, including those of a new subfamily, one new genus, Hofmonostomum, and 6 new species. Bibliography of 40 titles. A monograph of the subfamily.

Diseases and Parasites: Of turtles

Wieczorowski, Elsie. Parasitic lesions in turtles, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 25(5), Oct. 1939, pp. 395-399, 1 pl.

Role of parasites in causing neoplasms; helminths found in 20 Chrysemys from Wisconsin; description and illustration of lesions. Bibliography of 9 titles.

Diseases and Parasites: Virus diseases

Beach, J. R., Chairman. Poultry diseases, Journ. Amer. Veterinary Medical Assoc. (221 N. La Salle St., Chicago, Ill. 75 cents a copy), 95(752), Nov. 1939, pp. 613-622.

Includes a conspectus and a bibliography (101 titles) of 21 virus diseases applying to wild birds as well as to poultry.

Ecology: Availability seasons Tennessee game foods

Wing, Leonard. Availability seasons of some Tennessee game-food plants, Journ. Tennessee Acad. Sci. (Dr. J. T. McGill, Vanderbilt University, Nashville, Tenn. 50 cents a copy), 13(4), 1939, pp. 325-327.

Notes for the vicinity of Norris, Tennessee, for 32 groups of plants. Some comment on utilization: beech probably the most valuable mast tree; flowering dogwood and dwarf sumac among the most important food-bearing plants of the region.

Ecology: Brood counts, waterfowl

Travis, Bernard V. Duck brood counts in Iowa during the summer of 1935, Iowa Bird Life (Winthrop, Iowa. 25 cents a copy), 9(4), pp. 46-50, 3 photos, 1 table.

Observations made on 17 bodies of water are summarized and tabulated; 107 broods of 6 species were counted. "The average number of ducklings in a brood for each of the species was: Blue-winged teal 5.9, mallard 6.8, shoveler 5.8, pintail 6.9, ruddy 4.7, and redhead 3.0."

Ecology: Census methods, beaver

Atwater, M. M. South Fork (Montana) beaver survey: 1939, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C. 75 cents a copy), 4(1), Jan. 1940, pp. 100-103, 1 table.

Censuses to determine present, and indicate potential, beaver populations were carried on; representative results are tabulated. With good management the number of animals could be doubled; poaching is the greatest drain.

Ecology: Census methods, prairie chicken

Davison, Verne E. An 8-year census of lesser prairie chickens, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C. 75 cents a copy), 4(1), Jan. 1940, pp. 55-62, 6 figs.

Counts of males on "gobbling grounds" were made from an automobile in early morning during the breeding seasons of 8 years, 1932-36, 1938-39. The actual numbers counted are tabulated and a variety of computations of them are given to demonstrate relative reliability of the estimates. "The minimum area to be censused as representative of a range is indicated as 2 x 2 miles square (2,540 acres) but the results from areas 3 x 3 or 4 x 4 miles square are more dependable. The 4 x 4 mile tract (10,260 acres) can be censused in 5 or 6 days using about 3 hours each day."

Ecology: Census methods, small mammals

Bole, B. P., Jr. The quadrat method of studying small mammal populations, Cleveland Museum of Nat. Hist. (Cleveland, Ohio) Sci. Publ. 5(4), pp. 15-77, 3 figs., 14 tables, Dec. 1939.

Review of methods, especially that of quadrats for estimating small mammal populations; discussion of actual use of the quadrat method by workers of the Cleveland Museum; and results of studies of population of 18 species. The author's conclusions are that:

"(1) The quadrat method provides an accurate means of determining small mammal abundances.

"(2) In general, the larger the quadrat the more accurate the results, and that quadrats 150 feet or 50 meters on a side or circular units of corresponding area are still small enough to be easily operated and are large enough to provide a high degree of accuracy, and hence should be considered the standard sizes for population investigations of mammals whose home ranges are of the same size or smaller than that of the quadrat.

"(3) The use of shelter-belts or outer tiers of quadrats about a central one is not justifiable because of the tremendous labor involved if the quadrat is maintained at standard size, because the belts themselves cause population disturbances within the quadrat, and because the data the belts yield can be put to better statistical use if the traps that furnished them are part of the quadrat itself.

"(4) More than one quadrat should be used in any given community, but should be placed no closer to each other on forests than 300 yards, and no closer than 100 yards in fields.

"(5) All parts of a quadrat must be ecologically uniform and similar to the larger area which it is meant to represent, if figures on populations for one particular habitat are desired.

"(6) A three-day trapping limit should be set, as the resident population is practically exhausted in this time.

"(7) Trapping within a quadrat must be thorough and executed with the sole purpose in mind of getting all the mammals out of it as swiftly as possible, for which reason traps should be set in underground or surface underways or wherever the mammals are, and should not be set at regular intervals within the quadrat, since the lairs and runways do not so arrange themselves in nature.

"(8) The use of insulated quadrats is futile as the metal sheeting used will cause spectacular changes in the ecological picture of the quadrat, particularly if moles are part of the small mammal fauna.

"(9) The use of very small quadrats (smaller than 100 feet on a side) is indefensible owing to the relatively high percentage of animals drifting into them from adjacent terrain.

"(10) Quadrats are found to be particularly useful in studying cyclical changes in small mammal populations and in collecting the less common species of a given small-mammal fauna."

Bibliography of 29 titles.

Ecology: Census methods, white-tailed deer

Erickson, Arnold B. Notes on a method for censusing white-tailed deer in the spring and summer, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C. 75 cents a copy), 4(1), Jan. 1940, pp. 15-18.

Author's abstract: "In 1937 a method was developed for censusing spring and summer deer populations in the Lake States (Minnesota). In this cruising method the following factors were controlling: the distance between cruising lines, density of cover, running distance, flushing distance, sight distance, cover visibility, type of cover, and sex and age of the deer. Observations on 38 deer flushed in the St. Croix Park, Minnesota, yielded the following information: average flushing distance 140 feet; running distance 70 feet to over a quarter of a mile; cover visibility for aspen (Populus tremuloides) types averaged 100 feet. In 18 of 38 observations deer were flushed from aspen types; the sex of 22 of the 38 deer flushed was determined--10 male, 12 female. By the use of the formula $P=\frac{A}{X}\frac{Z}{Y}$ where A is the total area; P the population; Z the number of deer flushed; X the miles of line cruised; and Y the average flushing distance, the deer population on 27,900 acres was calculated at 557.12 head or 12.78 per square mile or 50 acres per head."

Ecology: Census methods, wildlife

Grater, Russell K. Taking a wildlife census, National Park Service Region III (Santa Fe, N. Mex.) Quarterly, 1(2), Oct. 1939, pp. 17-21, 1 pl.

Notes on methods used for elk, deer, bighorn, antelope, moose, burro, and beaver. Censuses are useful and the making of them interesting.

Ecology: Fire effects

Hanson, Herbert C. Fire in land use and management, American Midland Naturalist (Notre Dame, Indiana. $1.00 a copy), 21(2), March 1939, pp. 415-434, 2 tables.

A discussion of the ecological effects of fire dealing slightly with only its injurious relations to wildlife. Of value to all wishing to consider the subject as a whole and especially for its extensive bibliography.

Ecology: Impoundments

Saugstad, Stanley. Effect of artificial pounds on our duck population, North Dakota Agr. Expt. Sta. (Fargo) Bimonthly Bul., 2(2), Nov. 1939, pp. 6-8, 2 photos.

During recent years more than 4,000 dams have been built in North Dakota. Few, however, of the ponds formed have attracted nesting waterfowl. The chief reason seems to be unsuitable marginal vegetation, a situation that in time will be remedied by natural processes, if grazing is controlled.

Ecology: Pheasant, ruffed grouse

Gould, Ernest W. Progress report of the Southern New Hampshire Pheasant Demonstration and Research Project, New Hampshire Fish and Game Dept. (Concord), 10 pp., tables, mimeographed, Dec. 1939.

Summary of work done and results obtained during the first year of a project under Federal Aid to the States in Wildlife Restoration. As in the other case reported on by Gould (abstracted p. 38), pheasants were released on a tract where food and cover were inadequate. Losses were, accordingly, heavy; The population fell from 112 in May to 19 in September; causes are analyzed. A table of mortality by cover types is interesting but could be interpreted better if the populations of the different types were known. The range of a single brood studied increased steadily week by week. The acreage of cover types included in 4 brood and 6 adult territories is tabulated. Nearly 1,800 fruit-bearing shrubs and trees were planted with 62 percent survival. The seed mixtures, rate of fertilizing, liming, and seeding are listed for 9 food patches; the average cost per acre was $25.24; average cost per 100 pounds of food produced $3.38. Nineteen thousand conifers to improve cover were planted at a labor cost of $6.34 per M. The report includes also life history notes upon ruffed grouse and on a supplementary pheasant study on farm land.

Ecology: Salt marsh

Taylor, Norman. Salt tolerance of Long Island salt marsh plants, New York State Museum (Albany) Circular 23, 42 pp., 19 figs., tables, Nov. 1939.

Report on field and laboratory studies of salt tolerances of 11 species. In general the plants were found to thrive in considerably fresher water than that to which they are usually exposed in nature. Tolerances being so wide, the author concludes that the effect of ditching salt marshes as a limiting factor on the plants is not what some assume it to be. His work indicates that it is of minor importance in changing vegetation.

Economics: Bats, Texas

Osborne, Ray. Bats are big aid to landowner, Monthly Bulletin Texas Game, Fish, and Oyster Commission (Austin), 3(1), Dec. 1939, p. 5.

Interesting notes on the life histories of Texas bats, and figures for guano production of several caves; from 20 to 70 tons are yielded annually by some of them; value of the guano $35 per ton.

Economics: Bird banding

Dodge, Natt N. Economics of bird banding, National Park Service Region III (Santa Fe, N. Mex.) Quarterly, 2(1), Jan. 1940, pp. 14-22, 1 pl.

Popular account of the need of conservation, economic importance of birds, history and results of bird banding, and cooperation of the National Park Service in the work. Bibliography of 13 titles.

Education: Conservation, review of the field

[Luttringer, Leo A., Jr.] The place of education in conservation, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 10(9), Dec. 1939, p. 10, 1 photo.

Review of the movement as presented at a conference of Conservation Education and Publicity Writers.

Education: Deeryard surveys

Welch, Charles, and A. G. Kettunen. Michigan's deer herd. A winter deeryard study for 4-H Club members, Michigan State College (East Lansing) Club Bul. 40, 30 pp., 25 figs., Oct. 1939.

The introduction by I. H. Bartlett refers to the original moderate number of deer, the advent of conditions favoring their increase, the overpopulation of winter yards, and the problems of management that confront the Department of Conservation. The body of the bulletin is a text for use in acquainting 4-H Club members with the factors responsible for the present status of Michigan's deer herd, with the characteristics of deer yards, their limiting factors, and the acreage relationship existing between the yards and the total deer range. Instructions are provided for mapping and reporting upon deer yards.

Education: Wildlife in vocational agricultural training

Whittle, C. A., H. B. Butner, and A. O. Duncan. A wild life program for Georgia farms, Georgia State Dept. of Education (Atlanta), 48 pp., illus., 1939.

Prepared for use in the instruction of students of vocational agriculture, this text discusses the place of wildlife on the farm, procuring wildlife for the farm, providing food and cover (called coverage), conserving wildlife, and trapping and skinning animals and handling furs, and gives brief accounts of the

more common vertebrates of the State. Bibliography of 14 titles.

Food Habits: Bears

Tench, C. V. Hunting down beef-eating bears, Forest and Outdoors (610 Canada Cement Bldg., Montreal, Canada), 35(11), Nov. 1939, pp. 331-332, 1 photo.

Heavy spring rains delaying the crop of wild berries, torrential streams preventing the animals from catching salmon, and reduction in the marmot population (also due to the storms) resulted in a shortage of food that apparently forced the bears to become stock-killers. Control became necessary and it was accomplished chiefly by government hunters with rifles. To the date of the article, more than 40 had been shot.

Food Habits: Chuckwalla

Shaw, Charles E. Food habits of the chuckwalla, Sauromalus obesus, Herpetologica (Walter L. Necker, 2001 N. Clark St., Chicago, Ill. 50 cents a copy), 1(6), 1939, p. 153.

Examination of 12 stomachs from San Diego County, California, revealed only vegetable food, scientific names of numerous items of which are given.

Food Habits: Crow

Kalmbach, E. R. The crow in its relation to agriculture, U. S. Dept. of Agriculture Farmers' Bul. 1102, 21 pp., 6 figs., 2 tables. Revised June 1939 (Jan. 1940) (Supt. of Documents, Washington, D. C. 5 cents a copy).

This well-known economic treatment of the crow, about half devoted to food habits and half to control measures, has been thoroughly revised. The changes relate especially to the author's studies of crows in relation to waterfowl on northern plains breeding grounds, the connection between the crow population of that region and the winter roosts in Oklahoma, and recently developed means of control. The general conclusion as to the economic status of the species remains the same as in the 1920 edition--the bird's tendencies for good or harm, from man's point of view, are about equal.

Food Habits: Deer, White-tailed

Lewis, M. G. Deer on refuge prefer peach twigs above other browse, Virginia Wildlife (Blacksburg, Va.), 3(3), Nov. 1939, p. 3.

Tabulation of number of shoots of 20 plants cropped on a tract near Salem, Va. Peach led with 118; black gum (103) and sour wood (49) were next.

Food Habits: Deer damage

McCain, Randall. Some effects of heavy deer concentrations in the Allegheny National Forest, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 11(10), Jan. 1940, pp. 10, 29, 1 fig., 1 table.

The deer population seems to have been increasing even recently as censuses showed acres per deer as 34 in 1935, 11 in 1936, 7 in 1937, and 2 in 1938. Fenced and unfenced plots in pine and spruce plantations revealed the damage being done by the deer. Pines outside the fence suffered 91% loss, those inside 11%; corresponding figures for spruce are: 36 and 20. Great difference in the condition of survivors also was apparent. The unfenced pine was browsed down to an average height of 4.6 inches, and the spruce 6.6; inside the fence these species averaged 24 and 20 inches, respectively. Suppressive effects upon native vegetation also were surveyed and are tabulated. Of comparable plots, a fenced one supported 303 plants of 9 species, while an unfenced one had only 140 plants of 7 kinds. Shrubs were more seriously injured than trees. In a third area a protected plot bore 1,786 stems, an unprotected one only 639.

Food Habits: Grouse, Ruffed

Kuhn, Tracy M. Fall foods of the ruffed grouse in Pennsylvania, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 11(10), Jan. 1940, pp. 4-5, 31, 1 fig., 5 tables.

Report on the contents of 230 crops. The average crop contained 5.2 different foods and had a volume of 8.3 cubic centimeters. The most important foods were cherry buds and twigs, sheep sorrel leaves, acorns, and aspen buds, with a combined volume of more than a third of the total food. Other items averaging from 4 to nearly 5 percent each were supplied by green brier, apple, foamflower, and grape. Animal food and that gleaned from crops were both negligible in quantity.

Food Habits: Gull, Herring

Mendall, Howard L. Food habits of the herring gull in relation to fresh-water game fishes in Maine, Wilson Bul. (Josselyn Van Tyne, University of Michigan, Ann Arbor. 60 cents a copy), 51(4), Dec. 1939, pp. 223-226, 1 table.

Report on 50 stomach analyses that are tabulated. Author's summary: "From the results of this study, it does not seem that the presence of Herring Gulls at the inland lakes of Maine need cause any alarm to fishermen. Most of the fishes taken by gulls are either species that are very abundant or else those having comparatively little value; predations on the abundant species cannot be considered as detrimental to sport fishing. The favorite game fishes, trout and salmon, were found to constitute one of the smallest items in the gulls' diet. Herring Gulls are not as yet very plentiful at any locality within the interior of the State except at Moosehead Lake, and unless a large population of the inland birds occurs in the future, it would seem unwise to practice

any control. The taking of weak, dying, or dead fishes is probably of distinct benefit as a disease-control measure on behalf of the fish population. The general scavenger qualities of the gull are very commendable, especially in the summer resort areas. Fishermen and summer residents of Maine's lakes should not overlook the fact that, from the food-habits data at hand, the Herring Gull, in its present numbers, is an asset and not a liability."

Food Habits: Leucosticte

Mowbray, Vincent. Food and feeding habits of the Sierra Nevada rosy finch, Yosemite Nature Notes (Yosemite National Park, Calif.), 19(1), Jan. 1940, pp. 5-6.

Leucosticte tephrocotis dawsoni. "Flycatching", and feeding on flower heads of Hulsea algida, Railardella scaposa, and Eriogonum lobbii, and upon the seeds of Arenaria nuttalli.

Food Habits: Lizards

Knowlton, George F. Lizard digestion studies, Herpetologica (Walter L. Necker, 2001 N. Clark St., Chicago, Ill. 50 cents a copy), 1(1), July 1936, pp. 9-10, 2 tables.

Laboratory studies of the rate of digestion of beet leafhoppers by Uta s. stansburiana and Sceloporus g. graciosus. Details of the experiments are presented in tables. Practically all leafhopper nymphs were digested by the lizards within 12 hours and 90 percent of the adults within 18 hours at temperatures of from 60° to 72° F.

Food Habits: Mink, raccoon

Hamilton, W. J., Jr. The summer food of minks and raccoons on the Montezuma Marsh, New York, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C. 75 cents a copy), 4(1), Jan. 1940, pp. 80-84, 2 tables.

The environment is described and availability of foods indicated. Analyses of 300 scats of minks revealed muskrats, fishes, and aquatic beetles as the most important food items; results from 163 raccoon scats indicated preference for wild fruits, corn, and insects. All foods of both animals are tabulated and discussed.

Food Habits: Nutritive value, grains, etc.

Titus, Harry W. Practical feeding of poultry, Yearbook U. S. Dept. of Agriculture 1939 (Supt. of Documents, Washington, D. C. $1.50 a copy), pp. 819-843, 3 pls., 9 tables.

Cited here principally on account of the results of analyses of feedstuffs it presents, some of which relate to grains, seeds, etc., in which wildlife managers are interested. Examples are: feterita, kafir, milo, proso,

shallu, and sunflower seeds. The composition of numerous grains and greens, and of feeds of animal origin is tabulated, as are also their principal mineral and vitamin constituents.

Food Habits: Ochotona

Butts, Edward. The labors of a cony, Yosemite Nature Notes (Yosemite National Park, Calif.), 19(1), Jan. 1940, pp. 3-4, 1 fig.

Description of feeding habits and analysis of a hay pile; contents: 62 willow tips, 31 Phacelia flower heads, 16 pieces of Carex, 1 stem of Lupinus longipes, and 2 plants of Queen Anne's lace.

Food Habits: Pheasant, Ring-necked

Fried, Louis A. The food habits of the ring-necked pheasant in Minnesota, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C. 75 cents a copy), 4(1), Jan. 1940, pp. 27-36, 1 graph, 4 tables.

Author's abstract: "The crop and gizzard contents of 659 Minnesota pheasants collected in every month of the year were analyzed. Cultivated grains formed 81.3% of the total annual food. Corn was the most important single item in the pheasant's diet, 49.5% of all the foods eaten. Other important grains were oats, barley, and wheat. The damage that pheasants are claimed to do to growing corn is greatly exaggerated. The annual wood crop is very little affected by pheasants even though they consume large quantities of wood seeds. Seeds of the foxtails (Setaria viridis and Setaria glauca) and common ragweed (Ambrosia artemisiaefolia) are the most important foods obtained from woods. Wolfberry (Symphoricarpos occidentalis) was the largest of the fruit items. Grasshoppers and crickets made up nearly 75% of the total volume of animal food. Grasshoppers were consumed in the largest amounts in April and July when in the egg and nymphal stages, respectively.

Food Habits: Rodents, Desert

Monson, Gale, and Wayne Kessler. Life history notes on the banner-tailed kangaroo rat, Merriam's kangaroo rat, and the white-throated wood rat in Arizona and New Mexico, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C. 75 cents a copy), 4(1), Jan. 1940, pp. 37-43, 2 tables.

Authors' abstract: "Seventy dens of the banner-tailed kangaroo rat (Dipodomys spectabilis), 74 of the Merriam's kangaroo rat (Dipodomys merriami), and 82 of the white-throated wood rat (Neotoma albigula), were excavated in southeastern Arizona and southwestern New Mexico in an effort to obtain life history information, particularly on food habits. Data thus collected indicated that these rodents subsist largely on the seeds and other parts of annual grasses, forbs, and desert shrubs. They are, therefore, not especially harmful to the perennial grasses regarded as the most valuable constituents of grazing. Although knowledge of the relationships of these rodents to range forage still

leaves much to be investigated, plans for controlling them should be carefully considered before being adopted."

Food Habits: Utilization of timber tree products

Van Dersal, William R. Some important timber trees and wildlife, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 5(5), Nov. 1939, pp. 103-107, 4 photos.

From an economic as well as a biologic point of view, wildlife is an asset to the forest which in turn provides it with a home. "There is no operation that is silviculturally sound which cannot influence wildlife to advantage if properly used." Forest values whether for timber production, wildlife, or soil and water conservation, fluctuate as one and the total worth of a forest depends on the maximum expression of its several values. This paper is devoted especially to portraying the values of timber trees to wildlife, which it does in a series of sketches giving general characteristics, number of species, and range of the trees, and their utilization by wildlife. The groups treated are the pines, Douglas fir, oaks, hemlocks, red gum, maples, redwood, cypress and spruce, tuliptree and tupelo, chestnut and beech, and ash, basswood, sycamore, and locust.

Forest Service: Annual Report 1938-39

Silcox, F. A. Report of the Chief of the Forest Service 1939, 48 pp. (Supt. of Documents, Washington, D. C. 10 cents a copy).

Wildlife is mentioned in an account of CCC work (both restoration and control activities), and in a special section (pp. 43-44) in which the numbers of big game and fur animals on the National Forests are summarized, and policies as to wildlife management are defined.

Life Histories: Beaver

Bradt, G. W. Breeding habits of beaver, Journ. Mammalogy (Wm. B. Davis, A. & M. College, College Station, Texas. $1.00 a copy), 20(4), Nov. 1939, pp. 486-489, 1 graph.

Notes on copulation, gestation period (about 4 months), weight at birth (about 1 pound), and growth rate in captivity for a year. Bibliography of 6 titles.

Life Histories: Bighorn

Davis, William B., and Walter P. Taylor. The bighorn sheep of Texas, Journ. Mammalogy (Wm. B. Davis, A. & M. College, College Station, Texas. $1.00 a copy), 20(4), Nov. 1939, pp. 440-455, 3 figs., 1 table.

The habitat of the animals, entirely west of the Pecos River, is described, and the population of 15 groups of mountains discussed. Life history details are treated as territorial preference, daily activities, beds, feces, movements, young, water requirements, and food. Propagation in captivity is

deemed feasible. Reasons for the small population are discussed; competition of livestock is apparently foremost, but there may be some unrecognized factor even more important. The number of bighorns in the region has never been large in the past and perhaps never will be great enough in the future to warrant an open season. Bibliography of 9 titles.

Life Histories: Crow

Imler, Ralph H., and Frank B. McClurry. Sex ratio and weights of crows wintering in Oklahoma, Wilson Bul. (Josselyn Van Tyne, University of Michigan, Ann Arbor. 60 cents a copy), 51(4), Dec. 1939, p. 244.

Of 1,000 birds picked up where a crow roost had been bombed, 526 were males, and 474 females; the average weights of those groups were 1.05 and 0.93 pounds, respectively.

Life Histories: Deer, White-tailed

Ruff, Frederick J. The white-tailed deer on the Pisgah National Game Preserve, North Carolina, U. S. Forest Service, Southern Region (Glenn Bldg., Atlanta, Ga.), 249 pp., 1 map, 7 figs., 37 tables, mimeographed, Nov. 1939. [Apparently a de luxe edition exists as spaces are left for 27 photographic illustrations of which a list and legends are given.]

Report of results of a detailed 3-year study that condenses a great deal of information on the characteristics, habits, and life history of the Pisgah deer. The food requirements are thoroughly considered, palatability ratings of available foods presented, and the carrying capacity of the range, and effects of deer use on vegetation discussed. There is a section also on diseases, parasites, and natural enemies. Conclusions and recommendations form a final chapter and an appendix contains tabulations of stomach contents, relative growth of plants under protection and under deer use, percentage of use of important plants, occurrence of internal parasites, use of salt, and composition of the major types and subtypes of vegetation on the Forest. Bibliography of 14 titles. A noteworthy compendium, the value of which will be the more appreciated with use.

Life Histories: Duck, Black

Kutz, Harry Leon. The diving ability of the black duck, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C. 75 cents a copy), 4(1), Jan. 1940, pp. 19-20.

Author's abstract: "Baiting with cracked corn in known depths marked with buoys revealed that black ducks (Anas rubripes) were able to dive and get grain in ten feet of water."

Life Histories: Flamingo

McCann, Charles. The flamingo (Phoenicopterus ruber antiquorum Temm.), Journ. Bombay Nat. Hist. Soc. (6 Apollo St., Bombay, India. 10 rupees a copy), 41(1), Aug. 1939, pp. 12-38, 7 pls.

A co-subspecies with P. r. ruber of the Americas; in connection with presenting notes on his own observations in Cutch, India, the author summarizes accounts by others, particularly those of Abel Chapman in Spain and Frank M. Chapman in the Bahamas. Distribution, and breeding grounds and breeding seasons are treated as well as nesting sites, nests, eggs, young, plumage, molt, structure of the beak and tongue, habits, food, relation of food to coloration, and migrations. Bibliography of 23 titles.

Life Histories: Foxes

Anon. The fox in New Hampshire, New Hampshire Fish and Game Dept. (Concord) Tech. Circular 1, 9 pp., 1 graph, tables, mimeographed, n. d.

Estimate of the fox population and of poultry losses due to foxes; number of animals taken annually 1928-35, and their fur value; seasons on foxes in New England and Middle Atlantic States; proportion of sportsmen hunting foxes; notes on food of red and gray foxes, compiled from a variety of sources, including 6 analyses of stomachs from New Hampshire.

Life Histories: Golden-eyes

Munro, J. A. Studies of waterfowl in British Columbia, Barrow's golden-eye, American golden-eye, Trans. Royal Canadian Inst. (198 College St., Toronto, Canada), 22(2), No. 48, pp. 259-318, Pls. 2-6, 4 figs., tables.

Distribution, life history, and economic status in British Columbia of the birds mentioned. The accounts include descriptions (accompanied by illustrations) of these in most respects closely similar species, and full statements of distribution, seasonal movements, courtship, nesting, and food habits. The Barrow's golden-eye, though the rarer form, has headquarters in British Columbia and is treated in most detail. For this species, sections are added on behavior of yearlings, general observations on females and young, and especially on population studies. The food of the two species is about the same under similar conditions of time and place. "While on fresh water both x x x food upon salmon eggs, insect larvae, and occasionally small fish. In salt waters they eat crustaceans and mollusks, and, for a short time, herring ova." The author believes that predation by these birds does not cause an appreciable drain on salmon eggs. Control is scarcely needed and is inadvisable because it might seriously reduce the population of the comparatively local Barrow's golden-eye.

Life Histories: Man-o'-war bird

Murphy, Robert Cushman. Man-o'-war, Natural History (American Museum of Natural History, New York, N. Y. 50 cents a copy), 44(3), Oct. 1939, pp. 133-143, 2 graphs, 16 photos.

Popular account of habits, distribution, plumage patterns, and relationships; authoritative, thoroughly and attractively illustrated.

Life Histories: Muskrat

Errington, Paul L. Observations on young muskrats in Iowa, Journ. Mammalogy (Wm. B. Davis, A. & M. College, College Station, Texas. $1.00 a copy), 20(4), Nov. 1939, pp. 465-478, 3 figs.

Author's summary: "During 5 years (1934 to 1938) of field work on Ondatra zibethica zibethica in Iowa, about 1900 small-sized young and nearly 800 larger individuals were handled. The data--especially those resulting from the tagging of 598 young--portray much of the life history, growth, and development of this animal for the first 8 months after birth. Numbers of very young animals in 138 evidently complete litters average 6.5; the members of 7 of these litters were kept by their mothers in different nests or in different marsh habitations. The sex ratio of 878 young in 162 litters less than 2 weeks old was 54.4 percent males, compared with the late fall and early winter ratio of 54.9 percent for 584 young of the year. At birth blind, and almost helpless, weighing about 21 grams and measuring 100 mm. in total length, the young commonly opened their eyes between the fourteenth and sixteenth days. They were then capable of considerable activity, weighed about 60 grams and measured about 200 mm. Weaning took place mostly in the fourth week, and the young (about 180 grams and 285 mm.) were living independently by the end of their first month. By this time their mothers, if pregnant, were generally ready to give birth to subsequent litters. The young reached the 'kit' stage (about 500 to 650 grams and 400 to 480 mm.) at between 70 and 90 days; at 5-1/2 months many were similar in size and appearance to small and medium-sized adults. The majority of the young of the year taken by trappers in November and December were from 5 to 8 months old and very adult-like except for their imperfect sexual development. Limited data indicate that, by the end of the first year, muskrats reach average weights close to 1100 grams, and lengths close to 550 mm. The larger young males showed signs of approaching sexual maturity by mid-winter, or at 8 to 9 months."

Bibliography of 11 titles.

Life Histories: Muskrat

Hamerstrom, F. N., Jr., and James Blake. Central Wisconsin muskrat study, American Midland Naturalist (Notre Dame, Indiana), 21(2), March 1939, pp. 514-520, 1 table.

Muskrat study in a drainage ditch environment; the results probably applicable to many drained areas in the upper Mississippi Valley. Constantly varying water levels were reflected all the time by shifting populations. Food habits are discussed and the food plants tabulated so as to show parts used and season and degree of utilization. Carex, Glyceria, Lycopus, Sparganium, and Typha are of most importance. Winter decrease in population is attributed to unbalance between food and water supplies; water conservation apparently is the best corrective. A few unsolved problems also are discussed. Bibliography of 8 titles.

Life Histories: Partridge, Chukar

Aron. The chukar partridge (Alectoris graeca chukar), New Hampshire Fish and Game Dept. (Concord) [4 pp.], mimeographed, n. d.

Popular account of the bird, its habits, natural range, introduction, food, breeding, and sporting value.

Life Histories: Pheasant, Ring-necked

Randall, Pierce E. Nesting habits and causes of nest mortality of the ringneck pheasant, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg, Pa. 10 cents a copy), 10(9), Dec. 1939, pp. 6-7, 30, 5 photos, 4 tables.

Observations on 310 nests in a first-class farming district. Clutch sizes: 4 to 23, average 10.8; earlier ones larger. Fertility 94, hatch 90, percent; sex ratio of adult birds 1:6. Location of nests as to types of cover is described and tabulated. The percentage of success was greatest (50) in pastures and potato field and lowest (0) in orchards, brush, woods, and grain stubble. Despite high losses, production was greatest in hayfields. The cocks showed territorial instincts but hens apparently did not; in a number of instances two occupied nests were observed only a foot or even less apart. Net nesting success was only 20.3, and in the best environments was less than 30, percent. In hayfields, late nests had a much higher degree of success than did early ones. Man's activities destroyed more nests (56.6 percent) than all other agencies combined; mowing alone was responsible for 39.7 percent of the losses. Predators caused 30.6 percent of the failures, skunks and crows outranking others. All nest losses are tabulated according to cause. Due to renestings, from 50-60 percent of the hen pheasants eventually succeeded in bringing off broods. A few improvements in management are suggested.

Life Histories: Phoebe

Stoner, Dayton. Temperature, growth, and other studies on the eastern phoebe, New York State Museum (Albany), Circ. 22, 42 pp., 27 figs., 5 tables, Nov. 1939.

Notes on habits of the phoebe and especially on its nests and nesting, including number, color, shape, size, and weight of eggs, and length of incubation period. From daily observations and measurements, temperature and growth records were made; they are discussed, tabulated, and illustrated. Seventeen different measurements were made to reveal growth changes in bones and feathers. The findings are summarized in 17 paragraphs and there is a bibliography of 42 titles.

Life Histories: Plover, Upland

Buss, Irven O., and Arthur S. Hawkins. The upland plover at Faville Grove, Wisconsin, Wilson Bul. (Jossolyn Van Tyne, University of Michigan, Ann Arbor. 60 cents a copy), 51(4), Dec. 1939, pp. 202-220, Pls. 7-8, 4 figs., tables.

This bird, once greatly reduced in numbers, has increased at Faville Grove in recent years and is reported as having become more common also in Minnesota and Pennsylvania. The authors have made an interesting life history study of this highly eligible species for which they discuss the pre-nesting period, courtship, nesting, re-nesting, incubation period, nests and eggs, choice of nesting site, success of nests, territory, post-nesting period, food habits, and management. General protection is essential and nests may be defended by fencing as the birds will not desert. Bibliography of 15 titles.

Life Histories: Quail, California

Erlor, J. T., Jr. Sex and age ratios in survival of the California quail, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C. 75 cents a copy), 4(1), Jan. 1940, pp. 92-99, 3 figs., 3 tables.

Author's abstract: "Data from museums, banders' reports, hunters' bags, and field observations provided 17,532 records for the California quail (Lophortyx californica). The sex ratio was 112.2♂♂:100♀♀, the age ratio (summer records excluded), 146 immature:100 adult. Both ratios varied according to locality, season, and year. Average survival calculated on the basis of age ratio is 8.5% from egg to one year, 51% from 6 to 18 months, and 50% per year after 12 months. The relations of population level (P), replacement (R), and survival (S) are considered for four localities; S=P (100-R). Age ratio data make it possible to determine local critical seasons for quail; a high proportion of immature birds apparently results from inimical winters, a low proportion from critical summers. Utilization of such information is suggested in planning quail management programs and in analyzing waterfowl and cyclical game losses."

Life Histories: Road-runner

Doble, J. Frank. The roadrunner in fact and folk-lore, 31 pp., 1939. Texas Game, Fish, and Oyster Commission (Austin). Reprinted from In The Shadow of History 1939 (Texas Folk-Lore Society, Austin) and in part from Natural History Magazine (American Museum of Natural History, New York, N. Y.), Sept. 1939.

Factual sections review the food, nesting, and general habits; role of the bird as a killer of rattlesnakes is discussed. Folklore is retold and folk names of the species catalogued. Conservation of the road-runner is urged.

Life Histories: Sparrow, Field

Walkinshaw, Lawrence H. Nesting of the field sparrow and survival of the young, Bird-Banding (Charles E. Floyd, 210 South St., Boston, Mass. 75 cents a copy), 10(3), July 1939, pp. 107-114, 1 map, tables; 10(4), Oct. 1939, pp. 149-157, 1 photo, tables.

Observations near Battle Creek, Michigan, on some 130 nests are reported upon as to general nesting habits of the species, eggs, incubation, and the young, their survival, and weights. Average number of eggs 3.39; sets were smaller in late than in early nests; incubation period, 11 days; that of fledging, 13-14 days; young were produced in 49 out of 97 nests to the number of 145 from 165 hatched eggs, a percentage of 57.5. Banding experience is described. Bibliography of 10 titles.

Life Histories: Squirrel, Fox, dens

Baumgartner, Luther L. Fox squirrel dens, Journ. Mammalogy (Wm. B. Davis, A. & M. College, College Station, Texas. $1.00 a copy), 20(4), Nov. 1939, pp. 456-465, 2 pls., 1 fig., 1 table.

Characteristics of dens and den trees; process of den formation (includes excavation of partly decayed wood, and constant trimming of entrances to size, which averages 2.9"x3.7"); factors involved in den formation; management suggestions. Tabulation of 169 dens as to species of tree in which located; white oak, elm, and beech comprised 55 percent of the total in Ohio. Squirrel conservation demands preservation of den trees.

Management: Attracting birds

McKenny, Margaret. Birds in the garden and how to attract them, xviii+349 pp., numerous plates, 1939. (Reynal and Hitchcock, 386 Fourth Ave., New York, N. Y. $5.00 a copy).

An attractive well-illustrated and easily legible book, the contents of which are in harmony with its impressive appearance. The author deals with a subject in which she has long been interested and she has put forth considerable effort to make the book factually satisfactory. The publishers have collaborated by including 120 pages of reference material giving details of real value to earnest users of the work. The text is organized in 16 chapters that treat of the value and habits of birds, planting in gardens, feeding devices, bird homes, water supply, and protection. Reference sections relate to plants useful to attract birds in various sections of the country and the birds attracted by them, to planting to attract waterfowl, planting city gardens, and to pertinent publications.

Management: Bob-white

Komarek, Roy. How Florida can protect its bob white quail, North Carolina Wildlife Conservation (Division of Game and Inland Fisheries, Raleigh), 4(1), Jan. 1940, pp. 6-11, 2 photos.

Environmental deficiencies may affect quail as seriously as overshooting. Favorable and unfavorable characteristics of environment and means of controlling cover and food production are discussed. Maintenance of year-round food supply and policy as to quail enemies also receive attention. Improvement of environment is preferable to artificial propagation; kill should be limited to 25 percent of the population. Popular misconceptions (rearing of second broods,

perils of inbreeding) are discounted. Reprinted from the Florida Magazine (not available here).

Management: Burning

Watson, Leroy, Jr. Controlled burning and the management of longleaf pine, Journ. Forestry (Mills Bldg., Washington, D. C. 50 cents a copy), 38(1), Jan. 1940, pp. 44-47.

"Although the advantages of controlled burning in x x x management of longleaf pine have been presented, the attitude of foresters remains in general one of opposition." The evidence is reviewed and the conclusion reached that "foresters in the long-leaf pine belt should act on the basis of available facts which show the advantages of properly controlled fires at intervals of several years." Wildlife is mentioned in connection with seed consumption (its role is not seriously detrimental to longleaf pine reproduction); and with cover control in game management. Bibliography of 27 titles.

Management: Cottontail

Hickie, Paul. Helping the cottontail, Michigan Conservation (Michigan Dept. of Conservation, Lansing), 9(5), Dec. 1939, pp. 3, 11, 12, 3 figs.

Kills in 1937 and 1938 were about 2,300,000 and 2,500,000, respectively. About 10 acres of land on the average are required to produce one rabbit for the hunter. One-fifth of the gunners get half of the cottontails bagged. The average take is 7-8 rabbits per year, the least successful hunters barely averaging one bunny each. The limit must be determined by the harvestable surplus the land will produce, not by what anyone thinks is "enough." Apparently nothing can put as many rabbits in coverts as the hunters desire, but they must learn to be content with what is feasible. Providing artificial cover is very helpful to the cottontail population and is something sportsmen can do to help themselves. Costly management measures will not ordinarily be adopted by farmers but the way is open for sportsmen to cooperate. The harvest should be in proportion to the crop.

Management: Environmental improvement

Dambach, Charles A., and E. E. Good. The effect of certain land use practices on populations of breeding birds in southwestern Ohio, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C. 75 cents a copy), 4(1), Jan. 1940, pp. 63-76, 1 pl., 2 figs., 6 tables.

Authors' abstract: "Counts of breeding bird populations incident to different land use practices were made on the Soil Conservation Service project area at Hamilton, Ohio during 1937, '38, and '39. Data were obtained by recording singing male territories and observing nesting activities of either sex. Cropland populations were greatest in meadows (47.90 pairs per 100 acres) followed in order by small grain (10.26) and corn (3.23). Populations for the

same crops when in strips varying from 98 to 130 feet wide were materially greater, averaging 92.73 pairs per 100 acres in meadow; 27.35 in small grain, and 3.82 in corn. The strips decreasing the size of acceptable territories is believed to be the most important factor contributing to this difference. Populations in protected woods were 225.35 pairs per 100 acres compared to only 111.11 in grazed woods. The total effect of soil conservation planning on breeding bird populations on farms actually replanned was to increase them 38.16 per cent. This estimate does not include increases resulting from miscellaneous beneficial practices but only those that affected a considerable proportion of the farm area."

Management: Farmer-sportsman relationship

Brown, C. B. The land user and the hunter, Arizona Wildlife and Sportsman (125 North Second Ave., Phoenix, Ariz. 15 cents a copy), 1(10), Oct. 1939, pp. 4-5.

Tabulation of land ownership in Arizona; only 24.6 percent is privately owned and only 1 percent cultivated. Nevertheless the policy of land users has benefitted wildlife. Sportsmen should recognize that fact, should keep clearly in mind where public use ends, and should maintain an attitude of friendly cooperation. A behavior code is given.

Management: Food patches

Anon. Wildlife food strip planting, Rhode Island Agr. Expt. Sta. (Kingston) Misc. Publ. 2, 3 pp. (mimeographed), Feb. 1939.

Locating, liming, fertilizing, and planting feed patches; a seed mixture is recommended; estimated cost per acre, not including labor, $36.

Management: Feeding

Anon. Needs of wildlife in winter, Outdoor Iowa (Iowa State Conservation Commission, Des Moines), 1(12), Dec. 1939, pp. 12-13.

Usefulness of winter feeding urged. The U. S. Soil Conservation Service has established 950 and the State Conservation Commission 415 emergency feeding stations. Suggestions as to supplies of food and grit and as to management of stations. Nearly 1,300 pounds of hegari seed was distributed to farmers to use in making food patches.

Management: Forest management in relation to wildlife management

Moore, E. B. Forest management in New Jersey, New Jersey Dept. of Conservation and Development (Trenton), 55 pp., 29 figs., 16 tables, 1939.

Three brief sections (pp. 21, 29, 46) of this booklet are devoted to wildlife. They refer to the effect of forest cuttings and plantings, the value of edge, the desirability of interspersion of wood, brush, marsh, and cultivated lands, the critical importance of winter food and cover, and to the value

in both forest and wildlife management of cleared fire lanes and food strips.

Management: Forest management in relation to wildlife management

Moore, E. B. Forest and wildlife management in the South Jersey pine barrens, Journ. Forestry (Mills Bldg., Washington, D. C. 50 cents a copy), 38(1), Jan. 1940, pp. 27-30, 1 fig.

Wildlife as the basis of recreation deserves consideration in connection with forest management. This calls for coordination of overlapping and sometimes conflicting objectives. Lack of fertility has resulted in the pine barrens being preserved practically as a wilderness. Fires are frequent. Recent forest practice has been directed toward increasing the proportion of pines among the preponderant oaks. As to wildlife, deer too plentiful for the interests of cranberry and blueberry growers; other game populations are sparse. Food is the limiting factor and management for increase should be directed toward thinning and opening the existing uniform cover so that more food will be produced. The work being done starts at known centers of quail and rabbit populations, radiating from which strips connecting clearings are cut, planted, and improved as to cover. Only native species (listed) are used for planting. From 12 to 15 percent of the total area is in strips and clearings including fire-breaks. A third of the total cost is considered properly chargeable to fire control. Bibliography of 7 titles.

Management: Forest wildlife

Mattoon, M. A. The third responsibility, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 10(9), Dec. 1939, pp. 14, 32, 1 photo.

After protection and maintenance of forests comes resource management which should be for multiple use. The wildlife-forest relationship should be kept in reasonable balance under technical guidance. Environment can be improved by relatively simple measures, some of which are mentioned. Management of wildlife calls particularly for adjustment of numbers to carrying capacity. The forester should cooperate fully with other authorities responsible for the welfare of wildlife. Education is necessary to public acceptance of wildlife management.

Management: General

Anon. Game management, Wisconsin Agr. Expt. Sta. (University of Wisconsin, Madison), Ann. Rep. 1938-39, Pt. 1 (Bul. 446), Nov. 1939, pp. 21-25, 1 map.

Map showing gradual spread of Hungarian partridges in southeastern Wisconsin from plantings made as early as 1908. Experiments with prairie chickens indicate that buds are not a subsistence ration for these birds. Farmers who wish to encourage them should leave a few corn shocks or a buckwheat stack in an open field for their use. The yield of certain wild food crops calculated from samples was seeds of: yellow and green foxtail grasses,

50-450 lbs. per acre; barnyard grass up to 300 lbs.; and lesser ragweed 80-130 lbs. Waste soybeans threshed out 150 pounds to the acre. Trapping studies revealed carrying capacity of a certain tract as 2 cottontails per acre and movements of the animals during the breeding season as far as a mile.

Management: General, Iowa

Scott, Thomas G., and George O. Hendrickson. Iowa's wildlife is increasing, Outdoor Iowa (Iowa State Conservation Commission, Des Moines), 1(12), Dec. 1939, supplement, 4 pp. unnumbered. Reprint from Farm Science Reporter, Jan. 1940.

Popular article referring to early abundance of wildlife and its depletion as the human population increased, to conservation efforts of the State Conservation Commission, and to cooperative programs of research as a basis for sound management. Illustrative experiences with the ring-necked pheasant and the bob-white. The farmer's role in conservation and farmer-sportsman relationships.

Management: Herd regulation

Edwards, Oliver T. 1939 Winter deer range survey report, Malheur National Forest, Oregon (John Day, Oreg.), 21 pp., 3 tables, mimeographed, 1 map (lithoprint), Aug. 1939.

Management problems have arisen due to too much protection and not enough utilization of big game. Overpopulation of mule deer on the Malheur Forest, evident as early as 1933, grew worse because existing laws and sentiment hindered herd regulation. A range survey in 1938 led to some remedial measures. In the 1939 report, estimates (based on ample counts) of the number of deer and of the carrying capacity indicate that the better ranges still have twice as many animals as they should have. Although the winter was favorable, some of the most important browse plants as bitterbrush and mountain mahogany suffered considerable damage. Remarks on populations and food utilization are given for 15 areas. Competition with elk is not yet very serious but the elk herd should be favored on only a limited portion of the Forest; all other areas should be managed primarily for mule deer. Competition with cattle is thoroughly discussed; the range has been overstocked with both cattle and deer; in properly regulated numbers they would not seriously compete. Winter losses were chiefly among yearling deer. The increase from breeding in 1938 was from 20 to 25 percent; for 1939 it is estimated at about 10 percent. Weights and antler measurements are given for many bucks, and weights for 91 does and 19 fawns. They indicate decline due to malnutrition. Management problems are discussed in the light of local economics and suggestions given additional to those in the 1938 report. The fifty percent reduction in deer numbers required is difficult to achieve by hunting, especially if public sentiment is in any degree adverse. An educational campaign is needed.

Management: Inventory, black brant

Moffitt, James. Ninth annual black brant census in California, California Fish and Game (Terminal Island, Calif.), 25(4), Oct. 1939, pp. 336-342, 1 table.

The tabulation shows the results for 7 localities in 9 years; the 1939 figure is a little larger than the average for the previous seven years but slightly less than that for 1938.

Management: Inventory, game on national forests

Shantz, H. L. America's wildlife, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 10(9), Dec. 1939, pp. 11, 27, 1 photo.

Review of Forest Service big game estimates for 1939; the total number of big game animals on national forests was estimated at 1,842,000, an increase of 6 percent over the figure for last year and of 300 percent over that for the first attempt in 1921. There is an average of more than 5 head of big game on every square mile within the national forest boundaries. It is calculated that 32 percent of all the big game in the United States is found on national forests; 62 percent on State and private lands; 4 percent on grazing districts; and the remaining 2 percent on National Park Service, Biological Survey, and Indian Service lands. Distribution by groups is summarized, deer being by far the most numerous class. Wildlife policies of the Forest Service are outlined.

Management: Inventory, pheasants, etc., Ohio

Hicks, Lawrence E. Status of Ohio game birds, 1938, Ohio Wildlife Research Station (Columbus), Release No. 122, 23 pp., 18 figs., 7 tables, Nov. 1939.

Trends in game bird populations in the major pheasant belt of 15 counties for the year are compared to those of previous years. There is a summary containing 24 paragraphs that give among other averages those for: pheasant nesting frequency (7 per square mile); nests per 100 acres in forage crops (12.5); number of pheasants per square mile (75 in 1938, 89 in 1939; different figures on pp. 1 and 2); bob-whites 1938, 57.3, and Hungarian partridges 1938, 7.2 per square mile; proportion of farm operators that hunt (about 2/3), their annual bag of all kinds of game (64 head); and pheasant highway mortality (7.7 birds per 1,000 miles). These and other matters are treated in detail in text, graphs, and tables. The numbers of crows and hawks seen by the field observers (17.7 and 0.80 per man day) were larger in counties having the most pheasants. The paper closes with a bibliography of 24 titles of related reports by Hicks and Leedy.

Management: Land planning for wildlife

Gabrielson, Ira N. Land use considers wildlife, U.S. Dept. of Agriculture, Extension Service Review (Supt. of Documents, Washington, D. C. 10 cents a copy), 10(11), Nov. 1939, p. 163.

Summary of refuge acquisition and development (254 areas, 13-1/2 million acres, 21 million dollars since 1934). The conservation of wildlife has a definite place in any program of land use, and is being considered by land planning agencies. The Biological Survey will be represented on State committees. Federal organizations involved are all interested in wildlife conservation and their combined efforts will be of much practical importance.

Management: Muskrat

Lay, Dan W. Survey indicates muskrat crop can be increased, Monthly Bulletin Texas Game, Fish, and Oyster Commission (Austin), 3(1), Dec. 1939, pp. 4-5, 1 photo.

Yields, not uncommonly 10 pelts to the acre, and prices 70-80 cents per skin, have interested Texas coastal farmers in muskrats. "Unwise trapping, grazing, turning, or other disturbances have serious effects on the muskrats." Good management pays, net returns often being $3. per acre. Muskrat lodges vary in average number from 0.11 to 11.9 in 5 different grades of environment, the characteristic plants of which are listed. Six management recommendations, cheap because mostly negative in character, are made, and in addition 5 others that require substantial expenditures. Marsh management could quadruple the muskrat harvest estimated for 3 counties in 1938 at 375,000 pelts valued at close to a quarter of a million dollars.

Management: Planting for wildlife, Connecticut

Cromie, G. A., and Raymond Kienholz. Survival and growth of exotic game-food shrubs, Connecticut Agr. Expt. Sta. cooperating with the Connecticut Forestry Dept. (Hartford), Rep. of Progress Circ. 6, 2 pp., mimeographed, Nov. 1939.

From observations made of plantings on State forests, the authors conclude: "(1) That the planting of exotic shrubs is unprofitable and useless unless a tremendous amount of weeding is done to protect them from the encroachment of native root-established and more vigorous species and specimens; (2) that almost everywhere along fence rows, in abandoned fields, pastures and in moist or rocky hillside woodland areas there are native food-bearing shrubs, trees and vines which will flower and fruit more abundantly if released from overtopping trees by a small amount of weeding--perhaps repeated at intervals of a few years; (3) where areas exist that have no or few native berry bearing plants, planting may be resorted to, but preference should be given to larger sized specimens of native species which can maintain themselves with a minimum of attention."

Management: Planting for wildlife, Lespedeza sericea

Pieters, A. J. Lespedeza sericea and other perennial lespedezas for forage and soil conservation, U. S. Dept. of Agriculture Circular 534 (Supt. of Documents, Washington, D. C. 10 cents a copy), 43 pp., 27 figs., 7 tables, Nov. 1939 (Jan. 1940).

Discussion of adaptations, culture, and uses of Lespedeza sericea, with supplementary notes on other species and bibliography of 22 titles. A section (pp. 31-32) on "Sericea for Wildlife" calls attention to the value of the plant in providing food and cover and makes suggestions as to its planting.

Management: Planting for wildlife, Mississippi

Batson, F. S. Common native shrubs of Mississippi for landscape plantings, Mississippi Agr. Expt. Sta. (State College, Miss.), Mimeographed Circ. 100, March 1939, 13 pp., 1 table.

Although this publication does not mention wildlife, it will be of value to anyone undertaking a planting program in Mississippi or nearby. Directions for planting are included as well as descriptions of 34 species of shrubs, and a tabulation giving scientific and vernacular names of the plants, their types as to evergreen or deciduous, their heights in feet, light preferences, seasons of bloom, etc.

Management: Planting for wildlife and erosion control

Anon. Key to site adaptations of woody plants recommended for plantations, together with supplementary information, Soil Conservation Service Region One (Upper Darby, Pa.), 21 pp., mimeographed, 1939.

Plants are listed by scientific names according to their light tolerances and under each division, in conformity with their adaptations as to soil moisture and alkalinity. The table of supplementary information gives both scientific and vernacular names, states growth habit, type of planting to which adapted, wildlife food value, persistence of fruit, and planting range, and contains also remarks on resistance to browsing, cover value, etc.

Management: Planting for wildlife and erosion control

Franklin, Sydney. Mulching to establish vegetation on eroded areas of the Southeast, U. S. Dept. of Agriculture Leaflet 190 (Supt. of Documents, Washington, D. C. 5 cents a copy), 8 pp., 6 figs., 1939 (Jan. 1940).

Wildlife is barely mentioned in this publication but wildlife managers will be glad to have available its practical instructions in the use of mulch and nurse crops in establishing growths of ground cover, especially lespedezas.

Management: Ponds

Davis, William G. Wildlife will come where it is invited, Missouri Wildlife (208 Westport Rd., Kansas City, Mo.), 2(5), Dec. 1939, pp. 7, 11, 2 photos.

Development of ponds for erosion control improves conditions for wildlife and is of both esthetic and economic benefit. Suggestions are given as to planting to hold banks, to provide cover and windbreaks, and to reduce wave action. Protection from burrowing animals and from livestock may be necessary.

Management: Refuges, Federal program

Gabrielson, Ira N. The refuge program of the Biological Survey, Bird-Lore (1006 Fifth Ave., New York, N. Y. 30 cents a copy), 41(6), Nov.-Dec. 1939, pp. 325-332, 4 pls.

The concentration of the waterfowl population in comparatively restricted wintering areas makes it imperative that marshes in those regions be preserved or restored. Favorable wintering grounds in addition to suitable breeding tracts and migration-path refuges have been acquired by the Biological Survey through the years so that now there are about 13,500,000 acres in the Federal refuge system. Special objectives of some of both waterfowl and big game reservations are mentioned. Plans call for the addition of about 8,000,000 acres of refuge lands within the United States. The use of areas for conservation purposes obtained by easements is proving a useful supplement to the acquisition program, and now involves some 30 projects totalling about 133,000 acres. These and other refuge areas contribute also to water conservation, flood control, and recreational facilities. Further they are of benefit to many forms of wildlife besides those for which they have primarily been set aside.

Management: Refuges, Hart Mountain

Jewett, Stanley G. Hart Mountain Antelope Refuge, U. S. Dept. of Agriculture Misc. Publ. 355 (Supt. of Documents, Washington, D. C. 10 cents a copy), 26 pp., 23 figs., June 1939 (Jan. 1940).

History of the area, development of the refuge since its establishment in 1936, description as to topography and life zones and their characteristic plants and animals. Mammals and birds known from the area are listed, and information for tourists and a list of other big game refuges given.

Management: Refuges, Mississippi

Anon. Game refuges in State comprise over 240,000 acres, Mississippi Game and Fish (Mississippi Game and Fish Commission, Jackson), 3(11), Nov. 1939, p. 1, 2.

List of 40 refuges and their acreages.

Management: Songbird

McAtee, W. L. A venture in songbird management, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C. 75 cents a copy), 4(1), Jan. 1940, pp. 85-89, 6 tables.

Near Glenn Dale, Md., installation of bird houses attracted birds so that in some seasons the normal population of the area was quadrupled. Brood production in typical years varied from 18.3 to 26.6 per acre. On the average, about half of the nest boxes were occupied. Diameter of entrance was probably the most important factor influencing birds in their choice of homes. The

sizes ordinarily recommended for various birds were found satisfactory except in the case of the house wren which preferred an entrance an inch or larger in diameter. Boxes placed at moderate heights (5-7 feet) were well utilized and were most convenient for inspecting and cleaning. Apparently from 80-90 percent insolation was most favorable for brood production. Intruders were best dealt with by simple removal.

Management: Stocking, caribou

Cox, William T. Woodland caribou in Minnesota, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 5(6), Dec. 1939, pp. 138-143, 156, 2 figs.

The woodland caribou has been extirpated from a great deal of the southern part of its range even in Canada and is far on the road to extinction. The Minnesota herd, reduced to 33 in 1913 and to a much lower number later, is to be recruited by animals transplanted from Saskatchewan. The bulk of this article is made up of Jack Manweiler's accounts of surveys of the Beltrami Island reservation where the animals were placed and of the capture of a number of caribous and bringing 7 calves to the project area.

Management: Stocking, pheasant

Gould, Ernest W. A study of the pheasant in New Hampshire during the spring and early summer, New Hampshire Fish and Game Dept. (Concord), 10 pp., 1 fig., 2 tables, mimeographed, n. d.

The history of 94 pen-raised pheasants liberated on an 800-acre State Game Refuge. The area lacked adequate cover and food and was heavily populated with predators. Most of the released birds dispersed rapidly and the remainder were depleted by predators or driven out by resident wild pheasants. Only one pen-raised cock persisted and only one of the restocked hens is known to have nested.

Management: Waterfowl

Hawkins, Arthur S., Frank C. Bellrose, Jr., and Harry G. Anderson. The waterfowl research program in Illinois, Illinois Natural History Survey (Urbana) Biological Notes 12, 16 pp., 1 fig., 8 tables (mimeographed), Oct. 1939.

Notes on kinds of work undertaken and reports on 2 branches of it, namely, a survey of the 1938 hunting season, and a study of foods and food habits of waterfowl. A paper on the former topic by Hawkins and Bellrose was abstracted in WILDLIFE REVIEW, No. 22, August 1939, p. 32, from which the present article differs in some respects. Total kill, including cripples lost, is estimated at 85,000. The proportion of male to female mallards increased through the season from 48 percent in the first half-month to 62 percent in the last. Average weights of mallards were: drakes 42.8, and ducks, 37.2, ounces.

Aquatic vegetation, unfavorably affected by drouth in 1938, improved in 1939; details of the findings are given for a number of bodies of water. A preliminary report is made on food habit studies. In 285 mallard stomachs, corn comprised 40 percent, and Leersia oryzoides 13 percent, of the food. Leading items in 62 pintail stomachs were: corn, 56 percent; Cyperus esculentus, 8, and Cephalanthus occidentalis, 6. Briefer mention is made of the food of lesser scaup, and ring-necked, ducks. "The belief, sometimes expressed, that baiting is necessary to prevent duck starvation, does not apply to Illinois conditions."

The authors' remarks on the waterfowl crop are of interest. "The goal of game management is the ethical harvesting of the surplus. A surplus is that part of a population in excess of a breeding stock large enough to maintain the species at some desired population level. In waterfowl at the present time, there is no surplus, because the desired population level is not in sight. We are, therefore, harvesting a portion of the capital stock. Although this is not good management, under the circumstances, it is the best thing to do. It means, however, that unusual vigilance must be directed toward the status of the capital stock, to guard against sharp deflation."

Management: Winter feeding

Benjamin, J. R. Foods, feeding, and feeders, Ohio Conservation Bul. (1106 State Office Bldg., Columbus, Ohio, 10 cents a copy), 3(12), Dec. 1939, pp. 3-4, illus.

Food should be available early and late, should be suitable and sufficient, and should not unduly expose the population being fed to predator attacks. Food patches are better than feeding stations but provision should be made for both. Planting of natural food-bearers also should not be neglected. Suggestions are made as to the best foods and methods of making them available, and a number of feeding devices are illustrated.

Natural History: Armadillo

Taber, F. Wallace. Extension of the range of the armadillo, Journ. Mammalogy (Wm. B. Davis, A. & M. College, College Station, Texas. $1.00 a copy), 20(4), Nov. 1939, pp. 489-493, 2 maps.

Range at different periods since 1880; it has extended steadily in Texas and recently has involved several other States for which records are cited. Bibliography of 6 titles.

Natural History: Birds of Newfoundland

Aldrich, John W., and David C. Nutt. Birds of eastern Newfoundland, Cleveland Mus. Nat. Hist. (Cleveland, Ohio), Scientific Publ. 4(2), pp. 13-42, Dec. 1939.

Annotated list of 93 forms, of which a chickadee, Penthestes atricapillus bartletti, and a robin, Turdus migratorius nigrideus, are described as new. Bibliography of 31 titles.

Natural History: Forest wildlife

Palmer, E. Laurence. Farm-forest facts, Cornell Rural School Leaflet (Cornell University, Ithaca, N. Y.), 33(2), Nov. 1939, 32 pp., 1 pl., 4 portraits, 6 figs., 14 cartoons, 3 tables.

Wildlife is discussed under the heads of: Forests and furs (economic value, take for alternate years 1927-36, study suggestions); forests and feathers (occurrence and kill of ruffed grouse, management suggestions); and forests and flesh (food value of forest animals, possible income from lease of hunting rights).

Natural History: Herpetology of Great Smoky Mountains National Park

King, Willis. A survey of the herpetology of Great Smoky Mountains National Park, American Midland Naturalist (Notre Dame, Indiana. $1.00 a copy), 21(3), May 1939, pp. 531-582, 9 figs., tables.

Annotated list of 70 species, including 25 salamanders, 11 frogs and toads, 8 lizards, 21 snakes, and 5 turtles. Bibliography of 40 titles.

Natural History: Herpetology of Oregon

Gordon, Kenneth. The amphibia and reptilia of Oregon, Oregon State College (Corvallis) Studies in Zoology, No. 1 (50 cents a copy), 82 pp., 7 pls., 37 figs., May 1939.

Misconceptions relative to reptiles and amphibians, distributional areas of the State and their herpetological faunas, habitat distribution, life histories, economic importance, and treatment of snake bites. Illustrated key and running accounts (including description, habitat, and range) of 14 species of salamanders, 11 of toads and frogs, 14 of lizards, 23 of snakes, and 2 of turtles.

Natural History: Herpetology of Pennsylvania

Parling, R. Oldt. The amphibians and reptiles of Union County, Pennsylvania, Herpetologica (Walter L. Necker, 2001 N. Clark St., Chicago, Ill. 50 cents a copy), 1(6), 1939, pp. 165-169.

Annotated list of 24 species of amphibians and 22 of reptilians.

Natural History: Herpetology of Southwest

Cowles, R. B., and C. M. Bogert. The herpetology of the Boulder Dam Region (Nev., Ariz., Utah), Herpetologica (Walter L. Necker, 2001 N. Clark St., Chicago, Ill. 50 cents a copy), 1(2), December 1936, pp. 33-42.

Annotated list of 7 amphibians, 19 lizards, 13 snakes, and 2 turtles.

Natural History: Herpetology of West Virginia

Green, N. Bayard. The amphibians and reptiles of Randolph County, West Virginia, Herpetologica (Walter L. Hooker, 2001 N. Clark St., Chicago, Ill. 50 cents a copy), 1(4), Nov. 1937, pp. 113-116.

Annotated list of 24 species of amphibians and 20 of reptiles.

Natural History: Mammals

Hamilton, W. J., Jr. American mammals. Their lives, habits, and economic relations. xii+434 pp., frontis.+92 figs., 1939 (McGraw-Hill Book Co., Inc., 330 West 42nd St., New York, N. Y. $3.75 a copy).

The author, an earnest student of mammals, who has contributed more than anyone else to knowledge of their food habits, is certainly qualified to prepare a good book on these animals and has done so. The approach is broadly ecological and the style that of a text-book, with lists of literature cited ending the chapters. The latter, numbering 18, treat ancestry, classification, adaptations, food, storage, reproduction, homes, hibernation, migration, populations, behavior, distribution, and economics. Sections probably of most interest to wildlife managers are those on food and storage (about 65 pp.), good general accounts that the author is eminently qualified to write, that on mammal populations, a subject which also has engaged some of his special research, and the chapters on economics, on which he has often written before. These relate to useful and injurious mammals, game and fur groups, and predators, all discussed both as to conservation and control. The book has an ample index.

Natural History: Mammals of Arizona

Cahalane, Victor H. Mammals of the Chiricahua Mountains, Cochise County, Arizona, Journ. Mammalogy (Wm. B. Davis, A. & M. College, College Station, Texas. $1.00 a copy), 20(4), Nov. 1939, pp. 418-440, 2 pls.

Annotated list of 64 species and subspecies; hypothetical list of 9; bibliography of 15 titles.

Natural History: New York wildlife in winter

Palmer, E. Laurence. Fields in winter, Cornell Rural School Leaflet (Cornell University, Ithaca, N. Y.), 33(3), Jan. 1940, 28 cartoons, 3 tables.

Analysis of the farm environment in relation to wildlife; nature and value of food and cover; how wildlife passes the winter; animal tracks; take and economic value of common game and fur animals, with some account also of non-game species.

Natural History: Snails of Illinois

Baker, Frank Collins. Fieldbook of Illinois land snails, Illinois Natural History Survey (Urbana) Manual 2, xi+166 pp., 4-1/4x7-1/8", illus., Aug. 1939.

Introductory chapters relate to the habits and habitats of snails, methods of collecting, preserving and identifying the animals, and to the history of the group and of its study in Illinois. Keys are given to all taxonomic divisions from families to varieties. The total number of forms treated is 122, and practically all of them are described and illustrated.

Natural History: Whales

Kellogg, Remington. Whales, giants of the sea, National Geographic Magazine (Hubbard Memorial Hall, Washington, D. C. 50 cents a copy), 77(1), Jan. 1940, pp. 35-90, 24 col. pls., numerous photos.

General account of whales and their commercial uses, and essays treating 36 groups of whales, dolphins, porpoises, and the narwhal, with respect to distribution, size, young, habits, food, diving ability, swimming speed, etc.

Propagation: Feeding fur animals

Kellogg, Charles E. Nutrition of fur animals, Yearbook U. S. Dept. of Agriculture 1939 (Supt. of Documents, Washington, D. C. $1.50 a copy), pp. 871-892, 2 pls., 9 tables.

Summary of the status of fur farming; accounts of the management including feeding, and the results of dietary research, of silver foxes and minks. Briefer treatment is given martens and fishers, and a section is devoted to domestic rabbits.

Propagation: Feeding gallinaceous game birds

Nestler, Ralph B. Feeding requirements of gallinaceous upland game birds, Yearbook U. S. Dept. of Agriculture 1939 (Supt. of Documents, Washington, D. C. $1.50 a copy), pp. 893-924, 11 figs., 8 tables.

Brief account of the gallinaceous game birds, both native and introduced, now in the United States and of the extent of their propagation. Notes on the food habits of the birds in the wild, with table summarizing information on 8 species. The desirability of providing feed patches and feeding shelters is pointed out and suggestions are given as to their establishment and maintenance. Studies of the nutritional requirements, especially as to vitamins and minerals, of gallinaceous game birds under controlled conditions are summarized, and modern feeding practices are described.

Propagation: Winter feeding of pheasants

Jurale, Bernard. Wintering game pheasants, Modern Game Breeding and Hunting Club News (J. A. Gardy Printing Co., 28 W. State St., Doylestown, Pa. 25 cents a copy), 10(1), Jan. 1940, pp. 6-7.

Inadequate winter feeding affects the appearance and performance of birds in the breeding season. The author reports on trial of various systems and concludes that an essential to proper diet is plenty of roughage, to take the place of the grass and other plants available in summer. He found the buds and bark of apple prunings and the leaves and even the stalks of corn fodder to be eaten.

Research: Activity recording

Spencer, Donald A. Electrical recording of the activities of small mammals, Journ. Mammalogy (Wm. B. Davis, A. & M. College, College Station, Texas. $1.00 a copy), 20(4), Nov. 1939, pp. 479-485, 7 figs. (1-3 on a plate).

Activity-recording machines are useful in connection with the planning of control measures. Illustration and description of a recorder, discussion of difficulties and methods of surmounting them. Suggestions as to the use of the apparatus in life-history studies.

Research: Banding

Mason, Edwin A. The amateur bird bander, Natural History (American Museum of Natural History, New York, N. Y. 50 cents a copy), 44(3), Oct. 1939, pp. 149-154, 11 photos.

Well illustrated popular account of bird banding as cooperated in by the Biological Survey, a few other organizations, and many individuals. General instructions and illustration of sample equipment and methods.

Research: Banding, pheasants

Kellogg, H. B., Jr. Pheasant banding statistics, Wisconsin Conservation Bul. (Wisconsin Conservation Dept., Madison), 4(12), Dec. 1939, pp. 49-51.

Of 4,844 bands returned, 4,507 were for pheasants stocked in 1938, 298 in 1937, and 30 in 1936; scattering returns represented birds banded as far back as 1929. Of the total birds upon which returns were made, 86.2, mostly young cocks, were shot during the open season. Out of 37.6 percent, for which information as to drift was available, about half were taken within 5 miles of the stocking site; long travels were 60 and 78 miles.

Research: Banding, woodcocks

Norris, Russell T., John D. Beule, and Allan T. Studholme. Banding woodcocks on Pennsylvania singing grounds, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C. 75 cents a copy), 4(1), Jan. 1940, pp. 8-14, 1 pl., 1 fig.

"A fairly heavy concentration of breeding woodcocks (Philohela minor) was found in the scrub oak-pitch pine forest type of central Pennsylvania. Forty singing grounds were found on the 950 acres investigated. To observe the singing male's reaction to an intruder, a woodcock was collected and mounted in standing position. This decoy was placed on a singing ground, where the resident male attempted to copulate with it 21 times during the evening flight period. After subsequent observations it was evident that all birds would not react similarly in the presence of the decoy; but of the 27 singing males that actually saw the mounted bird, 20--or 74 percent--attempted copulation the first night. The actions of the remaining seven may be attributed to several trapping technique defects. Plans for trapping the adult males on their singing grounds through the use of the decoy gradually evolved, and finally a No. 3 jump trap with enlarged jaws covered with gill netting was found to be satisfactory. Fourteen males were trapped and banded during the singing season. The trapped birds were not greatly frightened by the procedure and soon returned to normal singing activities."--Logan J. Bennett.

Research: Cooperative, in Iowa

Scott, Thomas G. Progress report of the Iowa Cooperative Wildlife Research Unit, October 1935 to October 1939, American Wildlife (Investment Bldg., Washington, D. C. 25 cents a copy), 28(6), Nov.-Dec. 1939, pp. 271-281, 9 photos, 1 table.

The fundamental objectives of the undertaking were: "(1) Development of practicable and efficient census techniques; (2) study of the economic importance of the various forms of wildlife, especially as affected by population fluctuations and differences in environment; (3) investigation of the limiting factors that tend to decrease or increase wildlife populations; and (4) development and testing of techniques and practices." A summary is given of results with the ring-necked pheasant, bob-white, mourning dove, blue-winged teal, coot, cottontail, muskrat, red fox, two species of skunks, and raccoon. There are notes also on less advanced studies and a tabulation recording the names of projects and investigators and the periods of investigation.

Research: Irradiation studies

Bissonnette, Thomas Hume. Sexual photoperiodicity in the blue jay (Cyanocitta cristata), Wilson Bul. (Josselyn Van Tyne, University of Michigan, Ann Arbor. 60 cents a copy), 51(4), Dec. 1939, pp. 227-232, Pls. 9-11.

Author's summary: "(1) The male Blue Jay is sexually photoperiodic and responds to increased illumination in December by almost, if not quite, com-

plete spermatogenesis and activation of the epididymis to breeding condition in twenty-eight days; (2) females also respond, but more slowly and less completely. Oviducts increase markedly in size and activity in a majority if not all experimentally lighted females; (3) exact uniformity of stages of activity of germ cells was not found in males taken from the wild within ten minutes of each other in March nor in experimentally activated birds at time of killing. This is also true of females; (4) larger germ cells and nuclei and smaller size of testes in Blue Jays than in Starlings make them easier to treat technically and study microscopically; (5) Blue Jays are hardy, easily kept and fed in captivity, and temperamentally good for experimental work."

Research: Metabolic rate in mice

Hatfield, Donald M. Rate of metabolism in Microtus and Peromyscus, The Murrelet (105 Anderson Hall, University of Washington, Seattle. 50 cents a copy), 20(3), Sept.-Dec. 1939, pp. 54-56, 2 tables.

Description of apparatus and method of experiment; measured by carbon dioxide output, meadow mice have a higher metabolic rate than do white-footed mice.

Research: Metabolism of turkey strains

Gerstell, Richard, and William H. Long. Physiological variations in wild turkeys and their significance in management, Pennsylvania Game Commission (Harrisburg) Research Bul. 2, 60 pp., 10 figs., 21 tables, 1939.

Gerstell, Richard. The inherent "wildness" of different strains of wild turkeys, pp. 1-19, 6 figs., 3 tables.

Strains of turkeys differ appreciably in "wildness" and the wilder types are more suitable for stocking as game. This bulletin reports on a physiological study of two strains, comparing them in their stages of development under both outdoor and laboratory conditions. Wildness is a result not only of parental education, association with other individuals, and reactions to environmental stimuli, but also of hereditary factors. Bibliography of 7 titles.

Long, William H. The heat production and muscular activity of two strains of wild turkeys, pp. 20-60, 4 figs., 18 tables.

This paper deals with an experimental study of the metabolism of the two strains, including the effects of fasting, activity, and age. Comparisons are given also of heat production, body temperature, rate of respiration and heartbeat, and the relations between body weight and organ weight of various birds and mammals. Apparatus and technique are described. Bibliography of 88 titles.

Research: National parks, southwest

McDougall, W. B. Wildlife management, National Park Service Region III (Santa Fe, N. Mex.), Quarterly, 1(2), Oct. 1939, pp. 36-40, 1 pl.

The goal of the Wildlife Division is "the restoration, preservation, and presentation to the public of complete biotic communities in all park areas." Research is needed and some of its particular requirements in the Southwest are pointed out. Problems for immediate as well as others for long-time investigation are suggested.

Research: Respiration apparatus

Long, William H. Apparatus for measuring metabolism and activity in wild animals, University of Michigan School of Forestry and Conservation Circular 5 (University of Michigan Press, Ann Arbor. 25 cents a copy), 35 pp., 5 figs, 1 table, 1939.

Description and illustration of apparatus making it "possible to observe and record automatically the effects of either constant or fluctuating temperature, humidity, and light on the animal's internal temperature, heat regulation, head production, heat loss, neuromuscular reaction, digestion, body weight, oxygen consumption, carbon-dioxide production, and water vaporized, without touching the animal during the experimental period." Bibliography of 36 titles.

Research: Rooting woody plants

Yeager, Lee E., and L. R. Tehon. Experiments with plant hormones in the propagation of wildlife food and cover, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C. 75 cents a copy), 4(1), Jan. 1940, pp. 1-7, 4 tables.

Authors' abstract: "About 350 cuttings each of dormant bittersweet, frost grape, red mulberry, and hawthorn were treated with Auxilin, Hormodin, and potassium permanganate solutions to determine the effect of these materials in stimulating root growth. Auxilin and Hormodin were used at the strength recommended by the manufacturers; potassium permanganate at the rate of 0.89 gram per 1,000 milliliters. The rooting medium was quartz sand and peat moss in nearly equal volume, placed in an ordinary greenhouse bench. The rooting period was 100 days, from December 20 to April 1. Bittersweet responded well to treatment with both Auxilin and Hormodin but hardly at all to potassium permanganate. Frost grape responded to treatment with potassium permanganate but was inhibited by Auxilin and Hormodin. Red mulberry responded slightly to Auxilin and potassium permanganate but was unaffected by Hormodin. Hawthorn cuttings were not affected by any of the treatments."

Readers wishing to pursue this subject further may appreciate references to 3 articles by N. H. Grace, et al in the Canadian Journal of Research (National Research Council, Ottawa), 17, C (10), Oct. 1939, pp. 318-338. These relate chiefly to the responses of dormant cuttings to indolyacetic acid, ethyl mercuric phosphate, cane sugar, and nutrient salts.

Research: Study cage

Wright, Bertrand A. The drop-bar activity cage, Turtox News (761-763 East 69th Place, Chicago, Ill.), 18(1), Jan. 1940, pp. 19-20, 2 photos.

For study of the periods of activity, especially of reptiles and amphibians both in laboratory and field, the author discarded electrical devices as too expensive and cumbersome and resorted to mechanical means of recording activity. The cage developed is described and illustrated.

Soil Conservation Service

Anon. New Soil Conservation Districts provide for managing farm game, Virginia Wildlife (Blacksburg, Va.), 3(3), Nov. 1939, pp. 1, 7.

Six districts, covering 19 counties, have already been organized in Virginia. Provisions of a typical work plan relating to wildlife are quoted.

Soil Conservation Service: Annual Report 1938-39

Bennett, H. H. Report of the Chief of the Soil Conservation Service, 1939, 70 pp., 18 tables (Supt. of Documents, Washington, D. C. 15 cents a copy).

Progress in restoration of wildlife habitat as part of the erosion control program is recorded on pages 35-37. The most beneficial practices are listed; pond development, beaver stocking, increased use of herbaceous vegetation, hedgerow management, and some of the effects of the work upon wildlife are discussed.

WILDLIFE LEAFLETS

Issues of interest to wildlife managers additional to those previously mentioned are listed below. Copies of these mimeographed leaflets can be obtained from the Biological Survey, U. S. Department of the Interior, Washington, D. C.

BS-146. Lake Mattamuskeet Wildlife Refuge, 2 pp., October 1939.

History and description of this 50,000 acre reservation in North Carolina; notes on hunting and fishing privileges, and on the principal waterfowl of the refuge.

BS-148. Status of the American bison in the United States and Alaska, 1939, 10 pp., 1 table, December 1939.

Number of the animals in the United States and Alaska, 5,029 (1939), an increase of 579 over the 1934 estimate. A five-page tabulation shows the location and ownership of herds, the number of males, females, and calves they included, and State, United States, and Alaska totals. Bibliography of 50 titles.

BS-149. Protecting field crops from waterfowl damage by means of reflectors and revolving beacons, by F. M. Uhler and Stephen Creech, 5 pp., 1 pl., November 1939.

Account of experiments in protecting buckwheat, rice, and lettuce by means of spinning reflectors and revolving beacons, the construction and use of which are described. The plate illustrates details of the devices.

NOTES AND NEWS

The Colorado State College Library (Fort Collins) has issued as its Bulletin 6, "The memoirs of Estes Park" by Milton Estes. The publication gives information on the locality and its wildlife during the period 1859-66.

Papers presented at the Third Northeastern Wildlife Conference in connection with the Eleventh Annual New England Game Conference, February 3-4, 1939. Mimeographed copies of all (10) of these are available at a cost of 25 cents per set; remittance should be made to David A. Aylward, 20 Spruce St., Boston, Mass. Four of the articles relate to fishes and one to conservation law; the other 5 are briefly abstracted herewith:

Webb, William L. The new program of the Roosevelt Wildlife Forest Experiment Station, New York State College of Forestry at Syracuse University, 5 pp.

Account of the establishment of the Station, its facilities, and research and educational programs, and its publications.

Greene, Willard C. Multiple blood parasites in waterfowl, 4 pp.

One bacilliform and three protozoan parasites found in the blood of black ducks on Cape Cod, Mass. Evidently subnormal ducks are likely to be those infested with blood parasites which bring on anemia, toxemia, malnutrition, lowered resistance to other diseases, and loss of strength and of ability to migrate, nest, and reproduce.

Hosley, N. W. The place of foods in New England wildlife management, 8 pp.

Much the same paper as abstracted in WILDLIFE REVIEW, No. 22, August 1939, p. 20, but with a somewhat fuller discussion of nutritional details, and a bibliography of 10 titles (3 others incomplete).

Morton, James N. Stepping up game production in Pennsylvania, 11 pp.

Modern developments including clean farming, increased posting of land, and growth in the number of hunters have intensified the problems of State game departments. The Pennsylvania organization is endeavoring to meet the situation by improving environments, bettering farmer-sportsman relationships, and readjusting the stocking program. Progress in each of these activities is discussed.

Miller, J. Paul. The Pittman-Robertson program and what it means to conservation, 6 pp.

Brief history of the legislation, abstract of its provisions, types of projects eligible for aid and conditions governing their approval; requirements as to technically trained personnel, supervision, and maintenance; brief description of projects approved in Northeastern States; necessity for cooperation of all interests involved.

Feeling that more light might well be had upon the tabulation "Take of certain mammals in New York State," reproduced in WILDLIFE REVIEW, No. 24, November 1939, p. 38, the compiler of the REVIEW appealed to the Conservation Department at Albany. Most of the reply by Robert W. Darrow is here quoted:

Our figures of reported take, of course, are not accurate as regards the actual number killed. They do, however, present a fairly sound indication of trend, which becomes more accurate when the figures are reduced to a take-per-license basis. When examined from this standpoint, it seems clear that, except for the muskrat, the various fur-bearers have been maintaining themselves or somewhat increasing since 1928, and especially since 1930.

It is unfortunate that Dr. Palmer chose 1927 as the year for which to give his initial figures, since for some unexplained reason the take of practically all the species was very markedly higher during this year than for a number of years before or any year since. An important consideration in analyzing these trends is the fact that during the 20's the fur market was at a very high level and greatly encouraged trapping; while since 1930 the reverse has largely been true. Another factor is that until the coming year, New York has not had a separate trapper's license.

Therefore, in figuring the take per license, all hunting licenses are included in the computation. I believe that since the 20's, the number of people taking out such licenses for purely hunting purposes have increased to a far greater degree than has the number of trappers. Therefore, it is possible that if we knew the actual number of trappers, the trend of the take among the fur-bearers would be considerably more favorable.

In any case, however, the abundance of muskrats does seem to have definitely decreased. How much of this may be attributable to draining and other operations which destroy muskrat range, we do not know. We are anticipating the establishment under the Pittman-Robertson program of a project dealing with fur-bearers, and hope that as a result of it, we will be able to build up a picture of just what these conditions actually are.

The otter, fisher and marten, as you undoubtedly know, were given a continuously closed season beginning in 1937.

Regarding cottontails and hares, it seems quite evident that a low point in their abundance was experienced between 1934 and 1937. They have now recovered to a considerable degree.

STATISTICS CONCERNING THE REPORTED TAKE OF CERTAIN GAME SPECIES IN NEW YORK, 1926-1937

Numbers Reported

Year	Red fox	Gray fox	Skunk	Mink	Muskrat	Raccoon	Opossum	Rabbit	Hare	Number of Hunting & Fishing Licenses
1926	18,726	2,402	75,648	8,328	274,242	28,750	1,926	733,462	51,434	351,260
1927	35,658	2,338	120,002	9,612	553,270	40,908	1,086	797,750	52,002	371,983
1928	10,616	2,269	72,673	7,133	347,113	27,886	1,328	564,792	49,036	369,054
1929	10,913	2,775	74,850	6,634	284,791	24,230	1,538	825,723	53,983	385,786
1930	8,644	2,652	53,541	5,481	202,731	20,820	1,129	902,239	52,881	391,622
1931	8,118	2,806	56,338	5,518	203,029	18,813	1,363	783,344	55,562	314,972
1932	7,697	3,443	44,905	4,641	170,073	18,686	1,169	876,203	64,531	287,147
1933	9,278	3,527	51,063	4,890	180,305	13,939	2,065	906,200	41,461	277,463
1934	9,009	4,933	32,988	6,509	149,652	20,364	2,516	835,625	52,328	284,283
1935	11,229	4,757	33,247	5,488	148,024	23,427	2,296	779,340	24,053	290,795
1936	10,593	4,247	42,669	5,608	165,825	26,921	2,908	597,966	23,953	298,623
1937	15,550	4,980	36,701	5,722	157,494	24,190	5,041	768,451	32,540	339,807

Reported Take Per License

1926	.053	.007	.209	.024	.782	.081	.005	2.086	.146
1927	.096	.006	.324	.026	1.489	.110	.003	2.142	.139
1928	.029	.006	.197	.019	.940	.076	.004	1.529	.136
1929	.028	.007	.194	.017	.739	.063	.004	2.141	.140
1930	.022	.007	.137	.014	.520	.053	.003	2.303	.135
1931	.026	.009	.178	.017	.644	.060	.004	2.480	.176
1932	.027	.012	.156	.016	.593	.065	.004	3.049	.225
1933	.033	.013	.184	.018	.650	.050	.007	3.268	.149
1934	.032	.017	.116	.023	.526	.072	.009	2.838	.114
1935	.039	.016	.114	.019	.509	.081	.008	2.678	.083
1936	.035	.014	.143	.019	.555	.090	.010	2.002	.080
1937	.046	.016	.119	.019	.464	.071	.089	2.488	.096

The report of the Ohio Cooperative Wildlife Research Station for the fiscal year 1938-39 was received during the holiday period. It is Release No. 118 of the Station at Columbus, Ohio, and comprises 11 mimeographed pages. The report lists the places at which work is being done, and gives a roster of the staff and a directory of men formerly associated with the unit, mentioning their present employment. The status of research projects is shown in a tabulation, educational activities are summarized, and publications and manuscript reports on the work cataloged.

"Wildlife in the Farm Program," by James N. Morton (Bul. 16, Pennsylvania Game Commission, Harrisburg), abstracted in WILDLIFE REVIEW, No. 15, July 1938, pp. 26-27, has recently been reprinted for the third time. The four editions total 95,000 copies.

A prominent zoologist and biometrist recommends the following books on statistical theory and practice from the point of view of the biologist. They are named in the ascending order of their complexity:

Pearl, Raymond
Introduction to medical biometry and statistics, 2nd Ed., 459 pp., illus., 1930. W. B. Saunders Co., Philadelphia, Pa.

Simpson, George G., and Anne Roe
Quantitative zoology; numerical concepts and methods in the study of recent and fossil animals, xvii+414 pp., illus., 1939. McGraw-Hill Book Co., Inc., 330 West 42nd St., New York, N. Y.

Yule, George U., and M. G. Kendall
An introduction to the theory of statistics, 11th Ed., xiii+570 pp., illus., 1937. C. Griffiths & Co., Ltd., London, England.

A recent review highly recommends an additional book, saying, "No better work is available for the beginner." The reference is:

Snedecor, George W.
Statistical methods, xiii+388 pp., illus., 1938. Collegiate Press, Ames, Iowa.

The Quarterly Bulletin of the American Nature Association has been replaced by leaflets on green paper printed as an integral part of Nature Magazine (1214 Sixteenth St., N. W., Washington, D. C.). The first such brochure by E. Laurence Palmer was abstracted in WILDLIFE REVIEW, No. 24, November 1939, p. 16, and the second by William M. Rush in the present issue, p. 3.

"A pamphlet about pamphlets," by Lester Condit (University of Chicago Press, 104 pp., lithoprint, 1939, 75 cents a copy), may be of interest to many readers of WILDLIFE REVIEW. It defines pamphlets in a chiefly historical treatment, and suggests methods of preserving, arranging, and cataloging them. There is a bibliography of references pertaining to each chapter of the brochure, and an indexed list of manufacturers and dealers in library supplies.

The Houghton Mifflin Company (2 Park St., Boston, Mass.) announces publication under the editorship of Dr. John B. May of a revised edition of Forbush's "Birds of Massachusetts." Accounts of more than 100 species have been added and the title correspondingly changed to "Natural History of the Birds of Eastern and Central North America." The book runs to 600 pages, has 96 colored plates; the price is $4.95.

Al Belair, Minneapolis, Minnesota, is distributing a small tract entitled "Know your crow, its habits and control" in which, although damage by the bird is stressed, moderation in control is urged. The price is 10 cents per copy.

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